A PROGRAM FOR MANAGEMENT 1959 . . . No. 8

Improving Marketing

PAGE 153

SEPTEMBER 14, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

What the Steelworkers' Union Does With Its $33 Million Net Worth

Foundry Equipment Sales Climbing

How Employee Meetings Pay Dividends

Three Rules Aid Welders of 'T-1'

Midwest Firm Rolls Metals Ghost Thin

Scrapmen Expect Steady Poststrike Buying, with Upturn Next Spring

COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 101

METAL SHOW • Booth 528
International Amphitheater
Chicago • November 2-6

How B&W JOB-MATCHED TUBING provides flexibility of design

Design with tubing — but be sure it's B&W because you can get:

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These are just a few of the reasons why it pays to specify B&W Job-Matched Tubing. Call your local B&W District Sales Specialist, or write for Bulletin TB-361 for full information. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pennsylvania.

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This Week in STEEL

The Metalworking Weekly

September 14, 1959 Vol. 145—No. 11

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Index available semiannually.
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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED SEPT. 5	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	109† †Preliminary.	111	117	127

The latest 2 point dip in STEEL's industrial production index is accounted for by the final phase of the 1959 model closeout in motordom. Now that 1960s are coming off the assembly lines, the index (after Labor Day) will start a gradual climb.

Details on Page 131

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED SEPT. 12	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	20,000* *Estimated.	15,674† †Preliminary.	72,603	24,072

Even with time out for Labor Day, the count of new cars in the latest week is expected to climb a notch on the strength of '60 model production at Chrysler Corp., American Motors, Studebaker-Packard, and a few GM divisions.

Details on Page 128

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED SEPT. 13	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	337*	332	335	1,780
Index (1947-49=100)	21.0*	20.7	20.9	110.8
Percentage of capacity	12.0*	11.7	11.7	65.9

*Estimated by STEEL; comparative figures reported by AISI.

Relatively little tonnage was lost by operating mills over the Labor Day holiday. Only minor changes in district rates are expected until the end of the strike, those stemming from shutdowns for needed repairs.

Details on Page 240

STEEL SCRAP PRICE COMPOSITE

	SEPT. 9	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$40.00	$39.00	$38.33	$42.67

New strength has pushed prices upward at several points, largely on dealer trading. Bullishness is increasing with scrapmen anticipating strong post-strike demand due to tight pig iron supply and iron ore shortages.

Details on Page 252

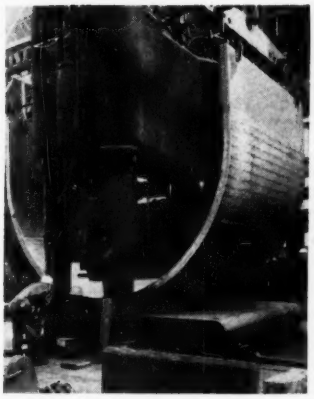
FINISHED STEEL PRICE INDEX

	SEPT. 8	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	186.5

Except for continued strength in foreign steel quotations, no change has taken place in the domestic price situation. Stability is expected to be maintained until the labor issue is definitely settled.

Details on Page 241

Steel Plate Covers for Testing Pit



These are steel protective covers for a huge pit that will house steam-turbine rotor testing facilities at General Electric's Large Steam Turbine-Generator department. They were produced by cold-bending 5-in. thick Bethlehem steel plate. Placed end-to-end, the five 49-ton pieces will form a structure about 40 ft long.

The uniform quality of Bethlehem plates makes them ideal for weldments. In fact, the use of Bethlehem plates, together with good welding technique, is the best way we know to be sure of sound welds. Bethlehem plates are available in a full range of sheared and universal mill sizes. For full details, call the nearest Bethlehem sales office.

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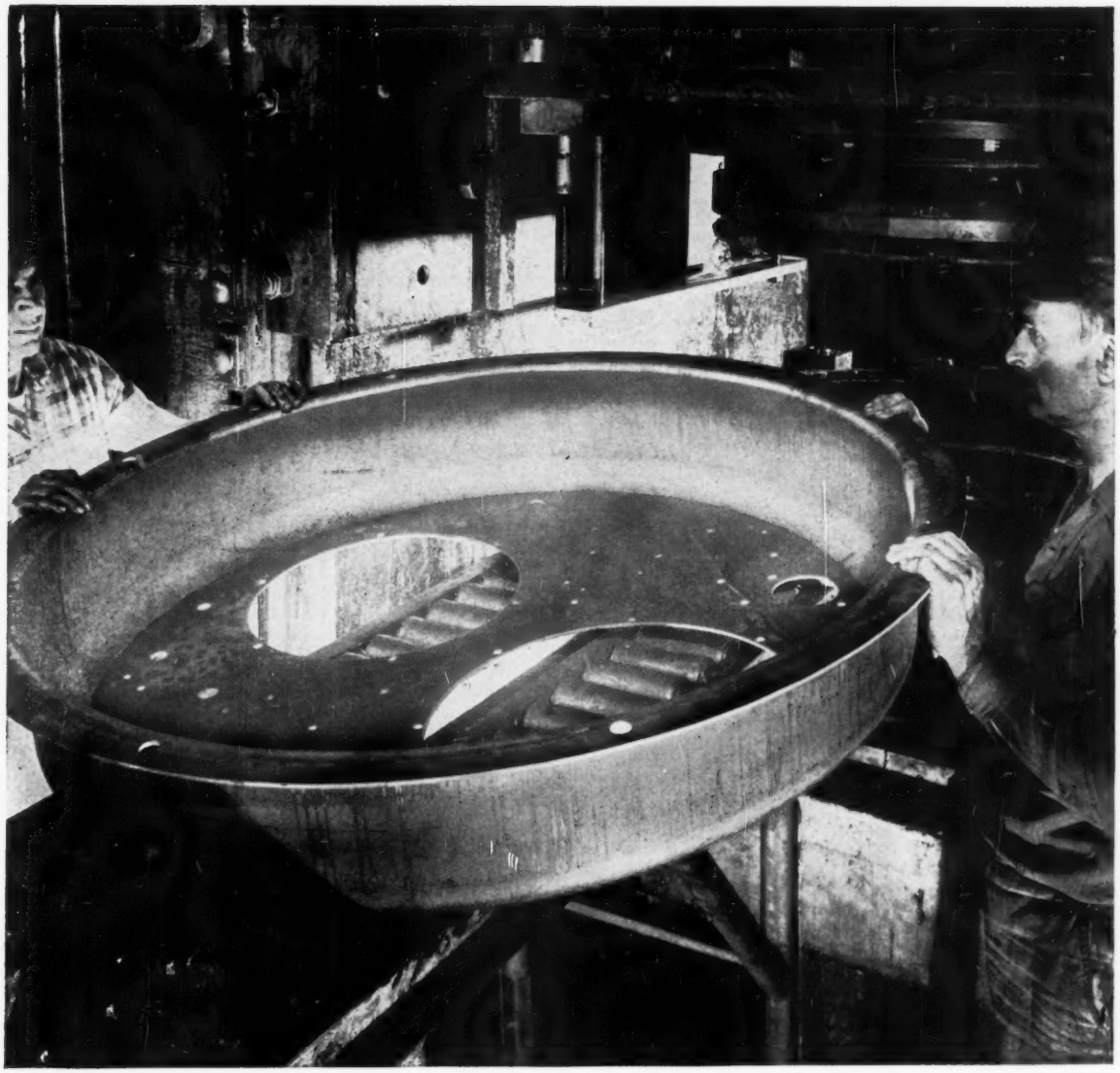

Just saved: 61 separate drilling operations

Dimensions and placement of everyone of the 63 holes in this Cleaver Brooks boiler door must be right on the nose. Tolerances of the dished stamping—plus or minus 1/16" on both the 60" diameter and flatness across the flange—must be held even *after* the holes are pierced.

COMMERCIAL meets all of these exacting requirements. It designed and turned out the forming and piercing dies, forms the heavy stampings and gang pierces the holes. And it's the same story all the way with the 36" and 48" diameter dished boiler doors COMMERCIAL also manufactures for Cleaver Brooks.

Only the first gang-pierced boiler door requires a tolerance inspection. After that, as in the case of the 60" diameter stamped door, it's 63 holes at one crack —all with identical, near-perfect size and location tolerances every time. And at no time do the actual stampings go beyond the limits of their specified plus or minus 1/16" tolerances.

Here's the kind of accurate, cost-saving metal forming service you may want to consider the next time you're in the market for a medium or heavy stamping—long or short run. Just send along a blueprint or complete information on your requirements. Our engineers will cooperate fully. Address Commercial Shearing & Stamping Company, Department L-38, Youngstown 1, Ohio.

COMMERCIAL SHEARING & STAMPING

Did a two-belt job handling red-hot coke

You'd look a long time to find a tougher conveyor job: tonnage is heavy—coke is highly abrasive—it's handled glowing hot—and it's side-loaded on the belt, an invitation to uneven wear. So, all things considered, management wasn't too unhappy with a 700,000-ton average from belts at this big steel mill's coke plant.

But the G.T.M.—Goodyear Technical Man—knew he could do better than that. His recommendation: a special Style B conveyor sinewed with plies of heavy-duty rayon to defy the abusive service.

And he was right again! In fact, the G.T.M.'s belt hustled almost 1,500,000 tons—better than twice the average of those previously used. And because it troughed better and trained more readily, it proved far easier to reverse for more equalized wear—held its fasteners better—needed less maintenance all around.

And that's just one more case where the G.T.M. had the answer—where competition had fallen far short. To put him to work on your problem, contact your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

• • •

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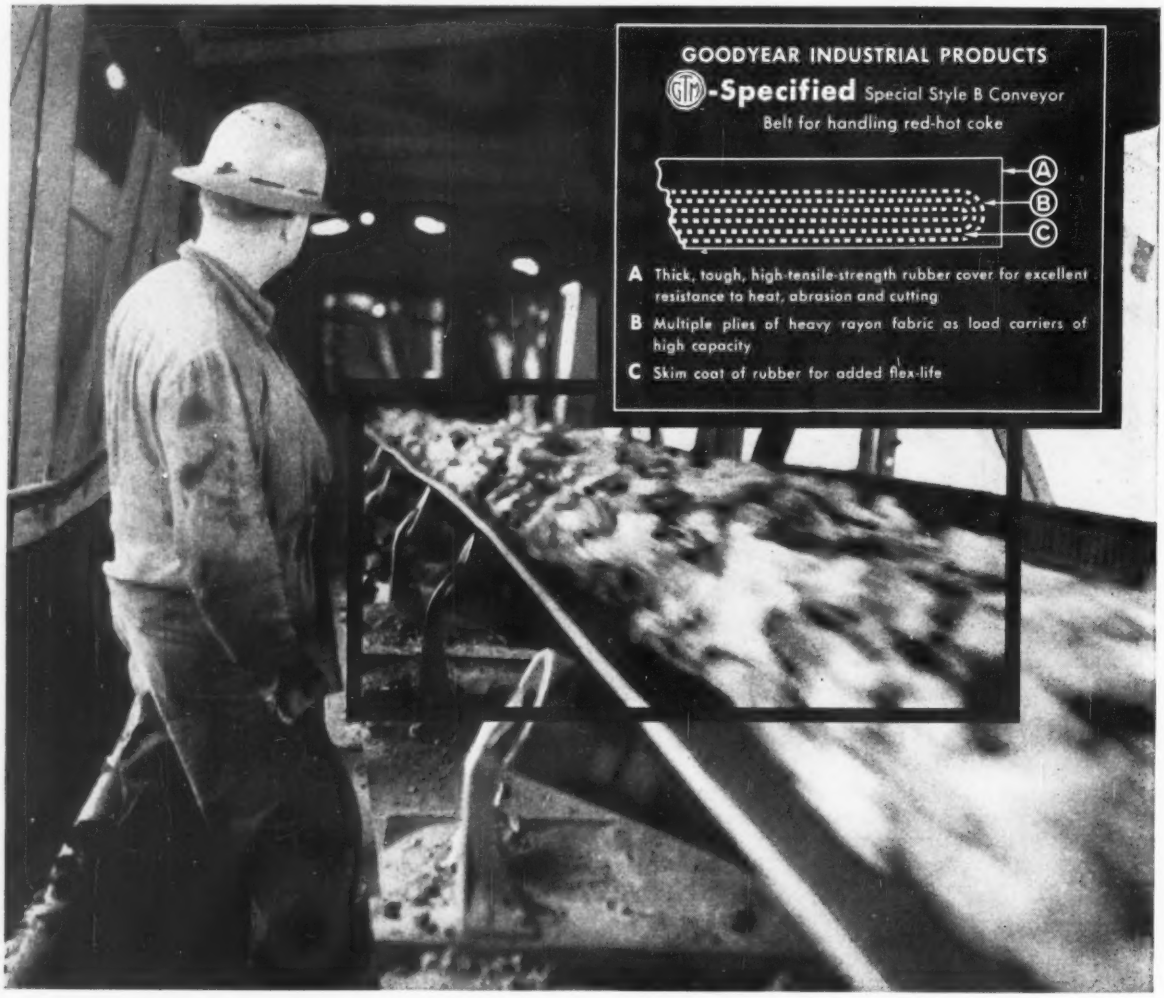
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B
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CONVEYOR BELTS BY

GOODYEAR

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Please direct all correspondence to attention of Ed Service, STEEL, 1213 W. Third St., Cleveland 13, Ohio.

September 14, 1959

This Makes Texans Happy

"Tsk, tsk; you should be ashamed to have left Alaska out of your list of states showing 'Geographical Distribution of Foundries,' STEEL, Aug. 17, p. 55," writes Ken Fowler, Training Dept., Bethlehem Steel Co., Sparrows Point, Md. "You show Wyoming, which has no foundries at all, and Hawaii, which (wasn't) even a state, officially. Come on, men, Alaska made it as number 49."

Ken, our apologies to you and the second youngest of the 50. The editors of *Foundry*, one of STEEL's sister publications, prepared the list and gave it to us. They had checked with various bureaus in Washington but couldn't pry out any information about foundries in Alaska.

We have a hunch that there's a foundry up there somewhere, and we're checking on it. You know how dog team mail is.

Look Out, Russia

Bill Verschoor, one of our eastern sales representatives, got a wallop out of a phone call from a new STEEL fan. The caller asked politely about the cost of a subscription. Bill detected a youthful quality in the caller's voice so he cautiously inquired about the gentleman's age. The reply: "I'm 12 years old and interested in metals and heavy industry and that's why I'm interested in getting a subscription to STEEL."

Bill told the lad, Dean Clealend, Overbrook Hills, Pa., that we would send him a few copies and look forward to hearing from him again, say in 1975. Anyone with the interests of Master Clealend should be a metalworking manager by that time.

The episode got us to thinking about you, the STEEL reader. Here's a brief composite of your profile as we see it.

The STEEL Reader

We figure there are 173,356 of you concentrated in four main management areas: Administration, production, engineering, and purchasing, mostly in administration. On an average you're 48 years old; you've been with your company 17½ years (and in your present job seven); you supervise nine people directly and 150 indirectly.

On a more personal basis: You have a B.S. in mechanical engineering from a leading engineering school (University of Michigan heads the list with Massachusetts Institute of Technology and Purdue University in the No. 2 and No. 3 spots). Your home is valued at $28,000; you have two cars, a Buick and a Ford; and you like fishing, golfing, hunting, and photography in your leisure hours.

Those facts are based on material developed through our continuing study of STEEL's readers. (Maybe we were a little generous with our estimate of Dean's capabilities, but we think he'll make it.)

Reluctant Dragons?

Associate Copy Editor Glenn Dietrich has been on the receiving end of yards and yards of stories publicizing the First International Trade Fair which is lighting the sky over Brno, Czechoslovakia. One blurb disclosed that the Chinese People's Republic would have an official collective exhibition stand at the fair. Among its displays of industrial-agrarian products, there'd be a "universal tractor, the Twin Dragon 80."

Every tractor buff knows that the Twin Dragon line is a takeoff on one of the Earthworm Co.'s lines, only the Chinese version rears up on its hind legs and belches flames.

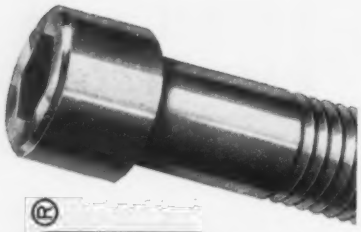
Want to be an Editor?

"The Aug. 3 article about Bob Wellman's Honorary Editor card was interesting," writes Larry Megow, general manager, Fabricated Steel Products Div., Hahn & Clay, Houston. "Interesting because it says: 'It was decided to issue cards to readers of merit,' but quite disappointing because it failed to let us regulars comprehend the qualifications necessary to meet the standards of a reader of merit.

"Sure I know what a reader is, and Webster defines merit as 'due reward or punishment.'

"I have two hobbies—collecting pictures of my grandchildren and important wallet size cards. So what are the rules? Did I miss some back issues?"

First, Mr. Megow, let's read more of Webster's definition: ". . . reward deserved; a mark or token of excellence or approbation; a praise-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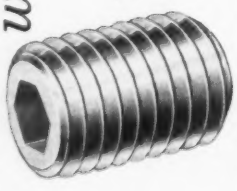

worthy quality or act; *to earn by service or performance . . .*"

Readers have been participating in STEEL's editorial endeavors for quite some time. The people who make outstanding contributions are considered Honorary Editor candidates. Bob Wellman is doing a solo so far, but we have our editorial eyes on a few other people who will fit this select group. Keep an eye on this column, Mr. Megow; the deeds of the upcoming Honorary Editors will explain more than mere words.

Point of Clarification

"In reading Metalworking Outlook, Aug. 17, the first item, dealing with striking workers collecting Supplemental Unemployment Benefits, has me puzzled," writes H. E. Helling Jr., assistant to the president, Mathews Conveyer Co., Ellwood City, Pa. "You indicate that Ohio steelworkers are collecting SUB checks and state that this is one reason why workers are not pressing for a settlement. It seems incongruous that strikers would qualify for SUB. Am I reading something into the article that wasn't intended?"

The word "retroactive" was missing, Mr. Helling. Some steelworkers were laid off in Ohio while it was illegal to collect SUB and state unemployment compensation simultaneously. Now it's legal, and they're getting retroactive SUB payments.

And It's Ductile Too

For a long time, many metallurgists believed 350,000 psi was the ultimate strength for alloys. Now it's possible to process a steel rated in the 400,000 to 500,000 psi range of ultimate tensile strength—and the metal has good ductility. Here's how it came to pass. In 1954, two Dutch metallurgists, Herren Lips and VanZuilen, noodled the idea of getting a stronger steel by heavy mechanical working of the metal at relatively hot (transformation) temperatures. Technical papers by those fellows whooped up a lot of interest in the theory and one of the men who pursued it was Dr. Victor F. Zackay, supervisor of the Physical Metallurgy Section in the Scientific Laboratory of Ford Motor Co.'s Engineering Staff. As a result, theory was translated into actuality within five years.

The kicker: The experiments perfected by Dr. Zackay and his associates far exceeded the expectations of the Dutch scientists. Ross Whitehead, one of STEEL's associate editors, traveled to Dearborn, Mich., to interview Dr. Zackay. For the story, "Ford Leaps the Tensile Barrier," see next week's STEEL.

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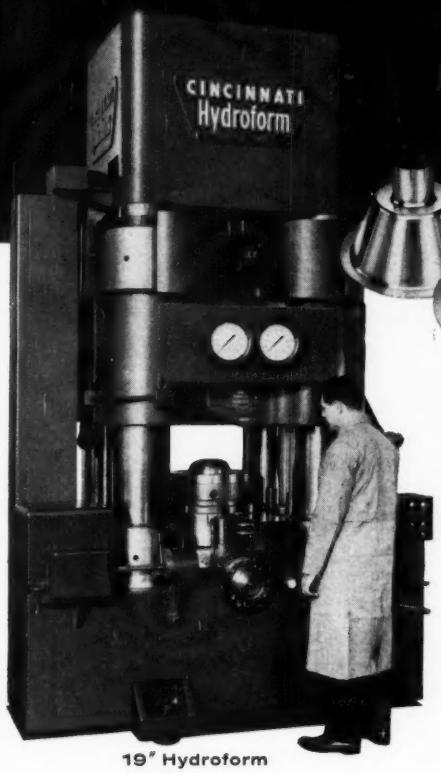

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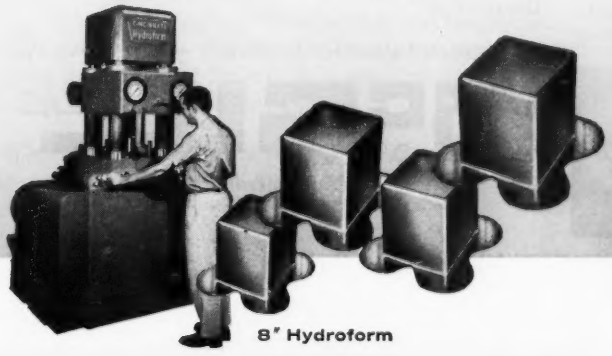

8″ Hydroform

Hydroform

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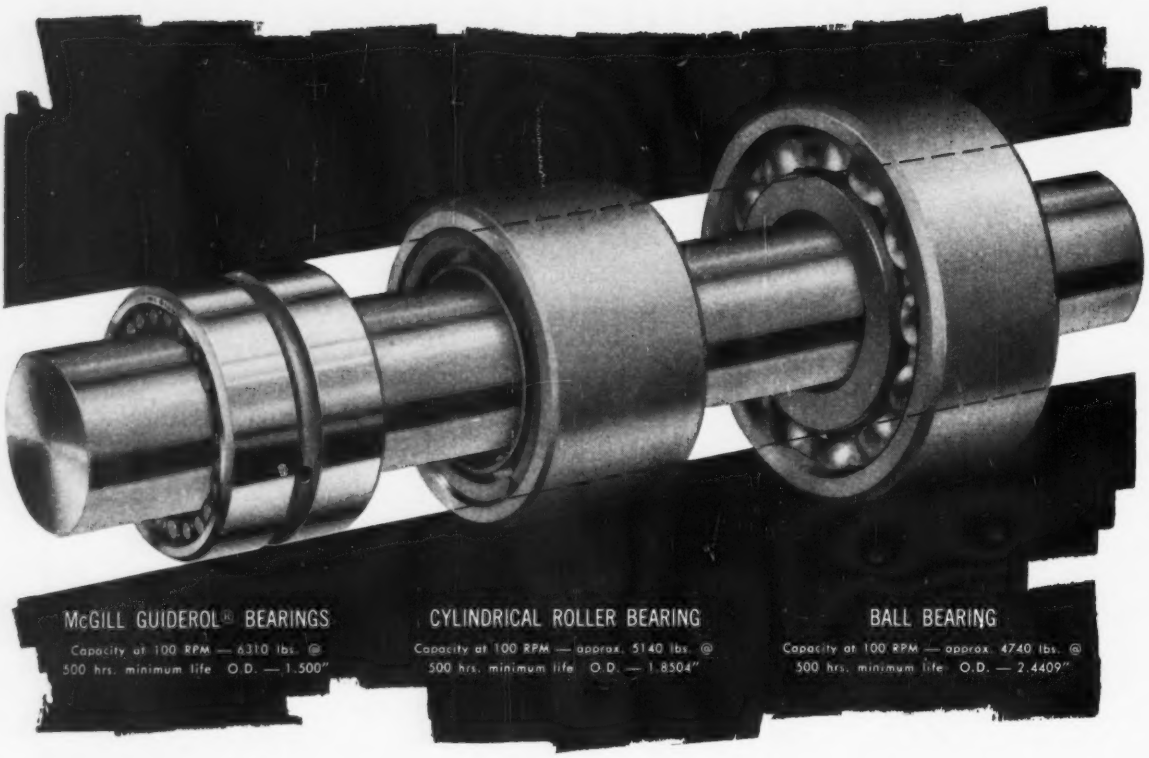
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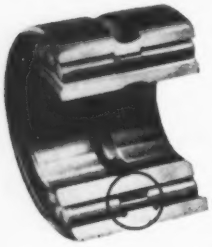
CENTER GUIDED ROLLERS



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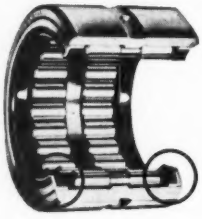

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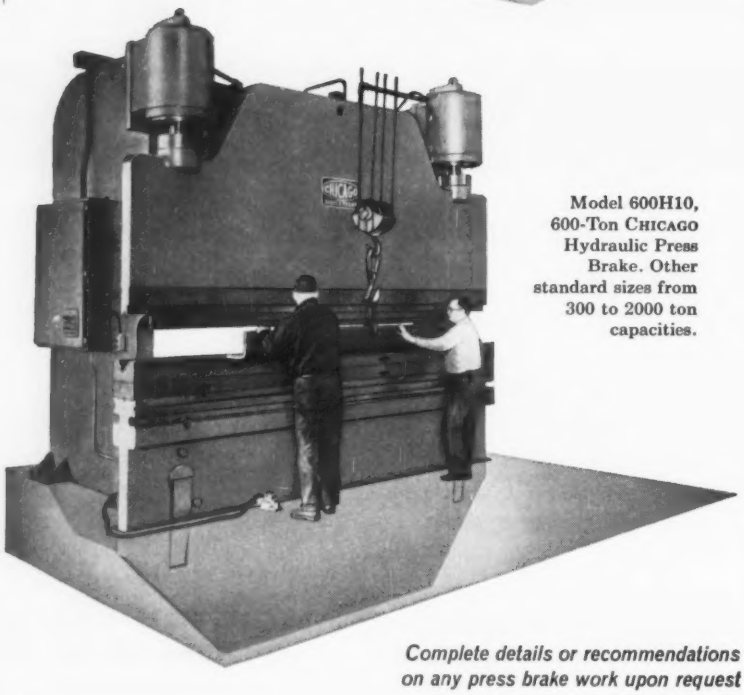

Model 600H10, 600-Ton CHICAGO Hydraulic Press Brake. Other standard sizes from 300 to 2000 ton capacities.

Complete details or recommendations on any press brake work upon request

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CALENDAR OF MEETINGS

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, American Mining Congress: Metal mining and industrial minerals convention, Denver. Congress' address: Ring Bldg., Washington 6, D. C. Executive vice president: Julian D. Conover.

Sept. 14-17, Society of Automotive Engineers: National farm, construction and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

Sept. 16-18, National Industrial Conference Board: Marketing conference, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

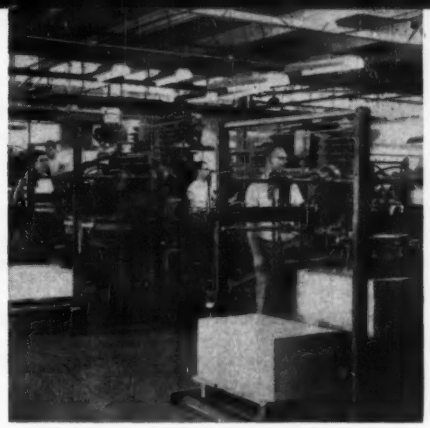
Sept. 17-18, American Society of Mechanical Engineers: Engineering management conference, Statler-Hilton Hotel, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Sept. 18, Malleable Founders' Society: Industry meeting, Hotel Sheraton-Cleveland, Cleveland. Society's address: 781 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Sept. 21-22, Steel Founders' Society of America: Fall meeting, Homestead Hotel, Hot Springs, Va. Society's address: 606 Terminal Tower, Cleveland 13, Ohio. Executive vice president: F. Kermit Donaldson.

Sept. 21-23, American Management Association: Personnel conference, Astor Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y.

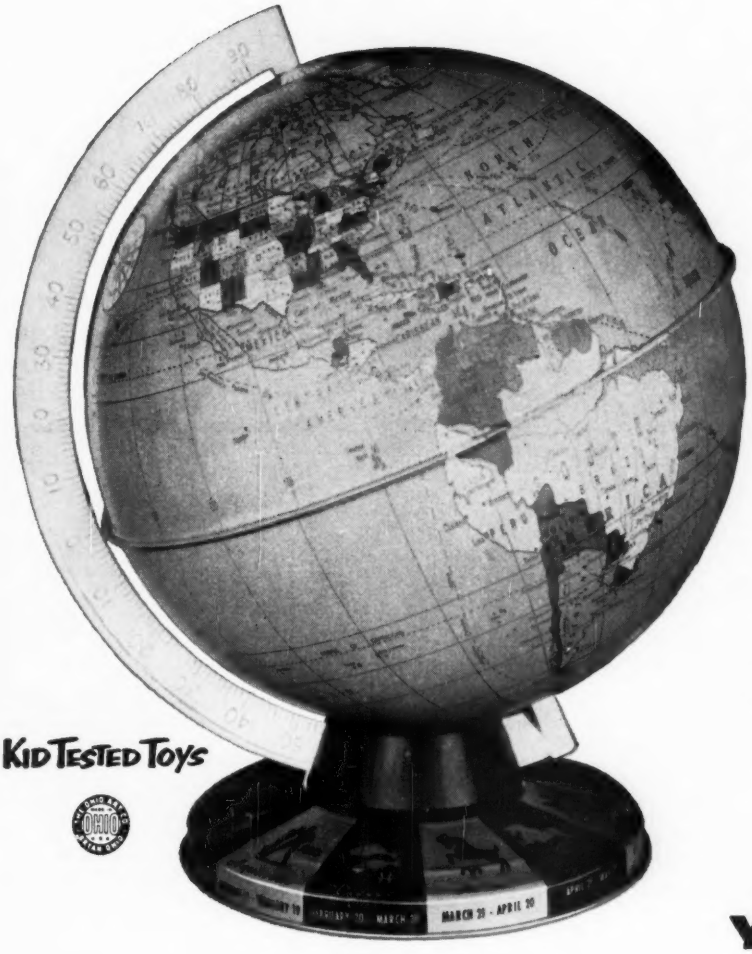
Sept. 21-25, Instrument-Automation Conference & Exhibit: International Amphitheatre, Chicago. Sponsor: Instrument Society of America, 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.



Ohio Art pressmen *are busily lithographing Youngstown Black Plate that will be subsequently blanked and formed to produce their line of educational World Globes.*

Accent on Excellence

Youngstown black plate



KID TESTED TOYS

This attractive World Globe—an all-time best seller to homes with growing children—is produced by 50-year-old Ohio Art Company of Bryan, Ohio.

These Globes are of durable metal construction and lithographed in striking full colors. The raw material used? Why Youngstown's Black Plate, of course. It's a quality steel that Ohio Art has found lithographs, draws, forms and blanks to perfection—helps keep the quality of their products at a high level.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

QUALITY YOUNGSTOWN SERVICE

Youngstown
Youngstown, Ohio

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Carbon, Alloy and Yoloy Steel

MUELLER BRASS CO. OFFERS 7 WAYS TO PRODUCE YOUR PART

Mueller Brass Co., because of its diversified manufacturing facilities that encompass a wide range of fabricating methods, is in the unique position of being able to offer you, the purchaser, an intelligent, unbiased analysis and recommendation of the best, most economical method by which your particular part can be produced. As the result of over 40 years' experience, the "Methods Analysis Department" has at its command complete knowledge of the advantages and limitations of each production process. After receiving detailed knowledge concerning the end use of the part, material specified, conditions under which it must operate and other pertinent factors, these analysis engineers make their recommendations. Every detail is considered. In many cases, methods analysis engineers recommend a simple design change that makes practical a much more economical method of production. This technical service, offered only by Mueller Brass Co., is given to each individual inquiry and is your assurance that you will get the best product at the best price . . . made the one best way . . . by Mueller Brass Co.

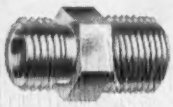
Send today for free technical literature on any one or all of the seven fabricating methods.

FORGINGS

Production equipment is available to produce press, hammer or cored forgings of any practical shape in sizes ranging from a few ounces to 150 lbs. in brass, bronze, aluminum and magnesium in 27 standard, as well as special, alloys.

COLD-PREST® IMPACT EXTRUSIONS

Mueller Brass Co. has complete machinery for producing Cold-Prest impact extrusions of aluminum, copper, brass, bronze and steel. Extrusions up to 28" in length are possible, depending on wall thickness and other design details. Parts can be designed having ribs, flutes, splines or bosses . . . with multiple wall diameters and with uniform or tapered wall sections.



SCREW MACHINE PRODUCTS

Mueller Brass Co. has one of the world's largest automatic screw machine departments fabricating both ferrous and non-ferrous custom parts. We can produce an infinite variety of shapes and sizes from ⅛" to 3¼" in wide range of free cutting and specialized alloys. Complete facilities for all secondary and finishing operations, as well.

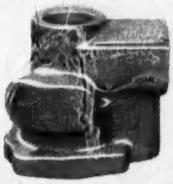
POWDER METAL PARTS

Mueller Brass Co. can supply precision Sinteel® powder metal parts in wide range of sizes and metals at high production rate. Parts available from iron, brass and copper alloys. Parts may be ordered with such characteristics as self-lubrication, controlled porosity and good electrical and magnetic properties.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

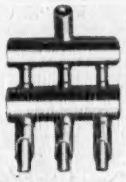
MUELLER BRASS CO.

...and our methods analysis service helps you determine which is the best ...and most economical method



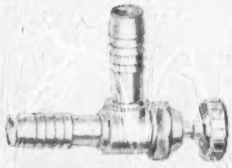
SAND CASTINGS

We specialize in the production of pressure-tight red brass castings. We utilize both metal match plate and wood patterns. Facilities include tool room and pattern shop, electric melting furnaces, high capacity core room and both bench and floor molding equipment to handle wide range of sizes.



FORMED COPPER TUBE

Mueller Brass Co. has modern facilities for forming seamless copper tube into a multitude of shapes. Forming methods used include bending, spinning, expanding or swedging, upsetting, flaring, flattening, beading and grooving, drilling and piercing, machining and joining. Formed copper tube coils are also available as single, double, spiral and serpentine shapes.



PLASTIC INJECTION MOLDING

Injection molding of plastic parts is still another process offered by the Mueller Brass Co. Parts are molded from such plastics as—nylon, polyethylenes, polyvinyl chloride, styrenes, linear acetal, chlorinated polyether, polycarbonates or polypropylene, dependent on part application.

MAN FROM MUELLER BRASS CO.

Since only Mueller Brass Co. can produce your part by all these methods, only the Man From Mueller Brass Co. can give sound advice on the one best method of production. Over 40 years of research, engineering, manufacturing and marketing experience stands behind him. When you are specifying and purchasing fabricated metal parts, call in the MAN FROM MUELLER BRASS CO.

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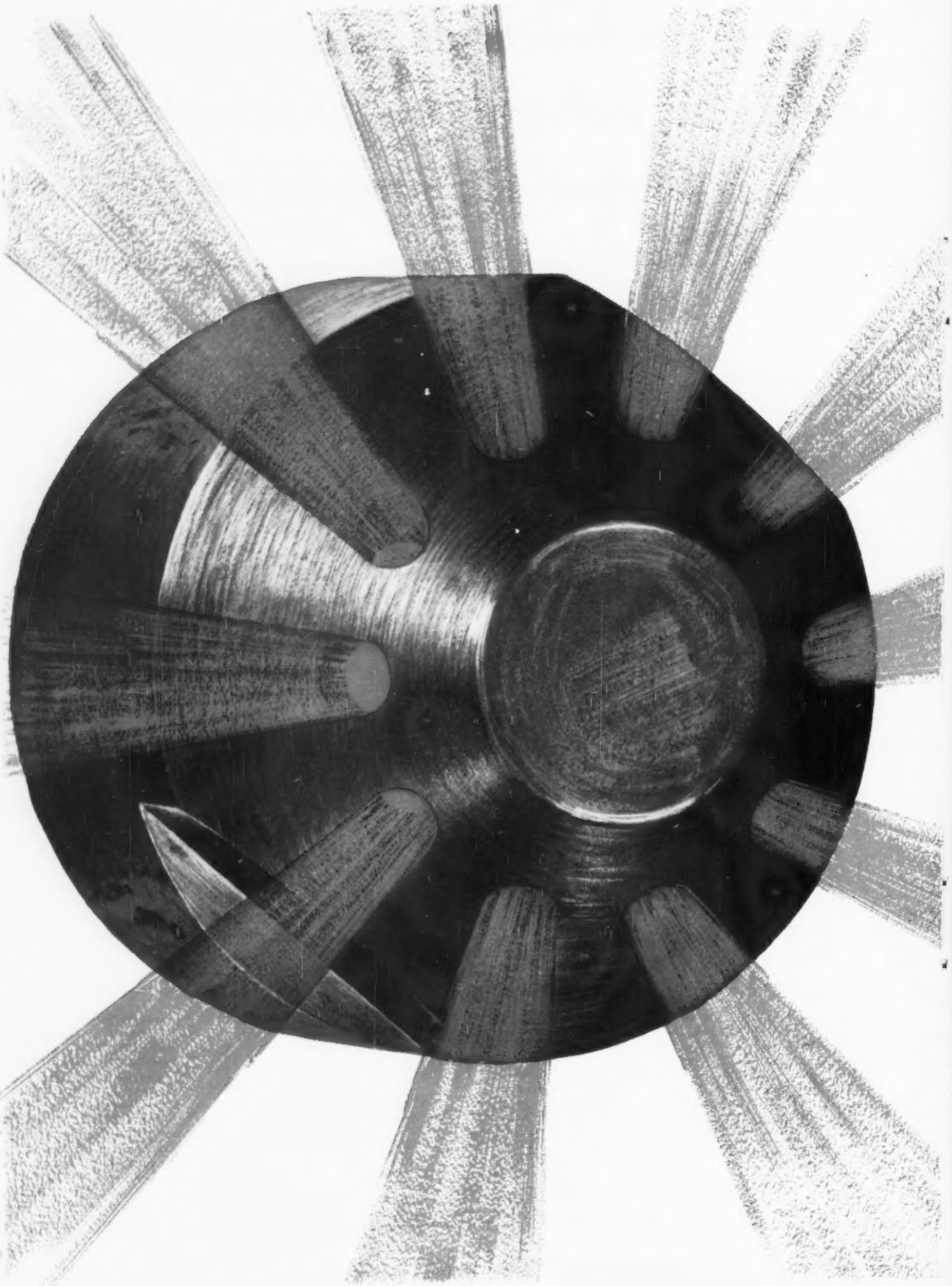
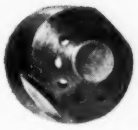
PORT HURON 26, MICHIGAN



FOR THE MACHINERY PART THAT TAKES THE BEATING



Critically contoured holes in burner nozzles made of high alloy steel . . . distorted in two days. Mild steel corroded in two hours. But HASTELLOY alloy B nozzles now last several months . . . despite the punishing, high-velocity flow of steam-atomized fuel oils containing sulphuric acid, sulphur compounds, and other corrosive agents.

It's just one more example of why thousands of design and production engineers looking for tough metals for machinery parts . . . specify HAYNES alloys.

If design and production in your field demand really tough metal parts, look into HAYNES alloys. There are more than 15 to choose from, including HAYNES STELLITE cobalt-base alloys, HAYNES iron-base alloys, HAYSTELLITE cast tungsten carbide, and HASTELLOY nickel-base alloys. They are available as castings, forgings, completely fabricated parts, or as sheet and bar stock. All parts can be furnished machined or ground to specified size and finish.

HAYNES Alloys *will do the job!*

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation
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Address inquiries to Haynes Stellite Company, 420 Lexington Avenue, New York 17, N. Y.

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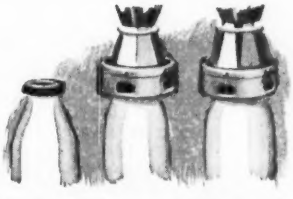
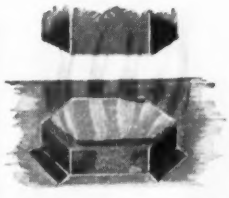
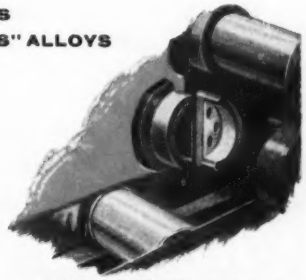
TYPICAL MACHINE PARTS OF ABRASION-RESISTANT "HAYNES" ALLOYS



MILK BOTTLE CAPPER sealing-segment fingers, investment cast of HAYNES STELLITE alloy No. 6, capped 100-million bottles in five years without noticeable wear.



DIE LINERS cast from HAYNES 93 alloy have worn only 0.015 in. while making 20,000 bricks from highly abrasive materials, far outlasting other metals.



HALF BUSHINGS made of HAYNES STELLITE alloy No. 6B are used as can headers of a machine that makes 300 milk cans a minute.

INCREASE Your PROFITS with ARONSON POSITIONING

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BENCH TURNTABLE POSITIONERS
GEAR DRIVEN POSITIONERS
HEADSTOCK - TAILSTOCK POSITIONERS
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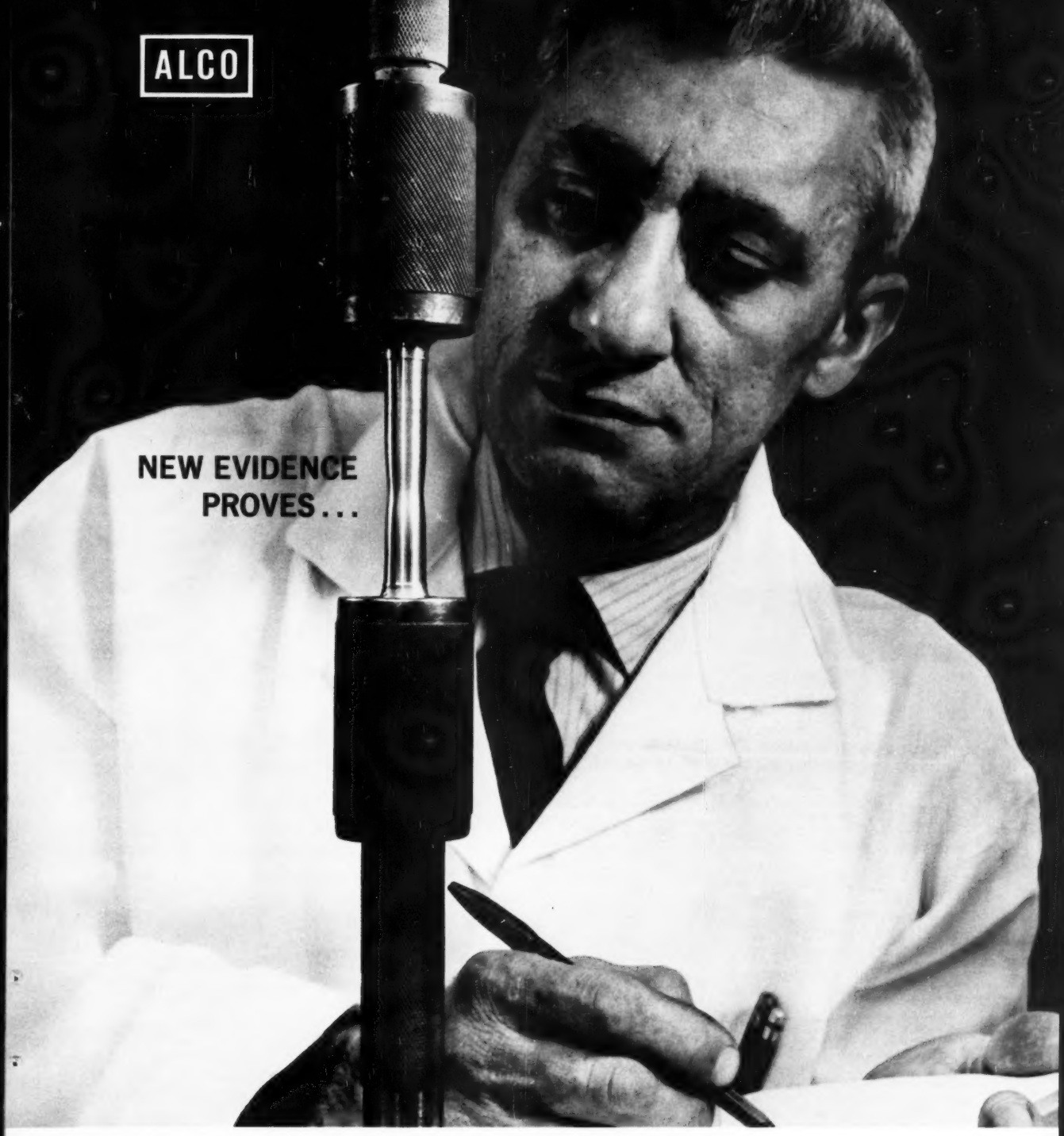


ALCO's Hi-Qua-Led Steel Forgings can raise your profit... without lowering your standards

CONCLUSIVE EVIDENCE:

NO CHANGE IN PROPERTIES
with the addition of lead in ALCO's

For the first time, here is published evidence establishing the superiority of one forging steel over all others. The evidence comes from actual production Hi-Qua-Led Steel forgings, tested by ALCO Products, Inc. and confirmed by a variety of customers after extensive value analysis.

The results as reported on these pages prove there are *no significant differences* between the physical properties of ALCO Hi-Qua-Led Steel forgings and unleaded forgings of the same grade. Couple this fact with Hi-Qua-Led's outstanding *machinability* advantages and you have the reasons why ALCO's unique leaded steel is the number one choice for forgings.

The tensile-test data compare physical properties of three steels: AISI 1045, 4140 and 4340, to the same grades (10L45, 41L40 and 43L40) with the ALCO lead addition. They prove that when lead is added by ALCO's special patented process there is no measurable effect upon yield and tensile strengths, and ductility.

Cost-cutting Hi-Qua-Led Steel forgings are available *only* from ALCO, in any steel grade. No other forgings can offer the benefits of Hi-Qua-Led: an increase in your manufacturing profits due to the superior machinability—along with maintenance of your product-quality standards because there is no loss in mechanical properties.

GRADES OF STEEL TESTED
1045 (216 Bhn) **VS.** **10L45*** (225 Bhn)
4140 (260 Bhn) **VS.** **41L40** (270 Bhn)
4340 (285 Bhn) **VS.** **43L40** (292 Bhn)

OTHER TEST RESULTS

FATIGUE STRENGTH—To 340 Brinell, there is no difference in fatigue strength between Hi-Qua-Led Steel forgings and regular forgings of the same grade. Above 340 Brinell, in smooth bar properties, there is a gradual drop-off in Hi-Qua-Led forgings to about 10 per cent at 400 Brinell. In notch-bar properties, there is no difference.

SURFACE FATIGUE—In the AISI 1000 series steels, Hi-Qua-Led Steel forgings have 30 per cent higher resistance to surface fatigue than their non-leaded counterparts. In the 4100 steels, Hi-Qua-Led has a 15 per cent advantage. In the 4300 series, there is no significant difference.

HARDENABILITY—Customers report "no observable difference" and "more uniform hardening and structure" with Hi-Qua-Led Steel forgings.

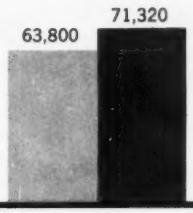
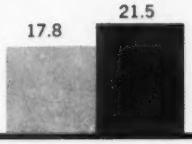
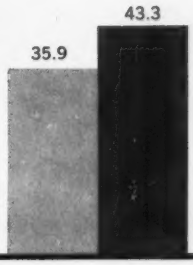
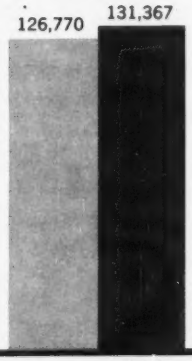
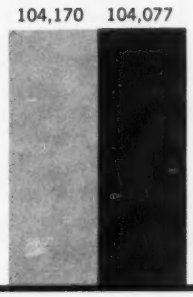
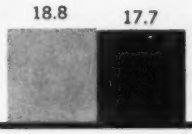
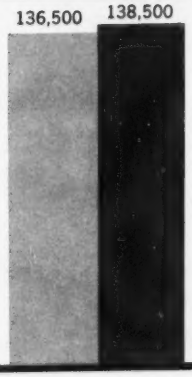
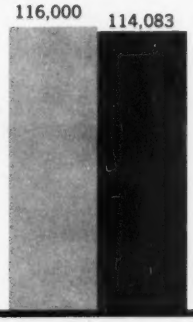
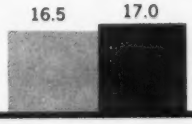
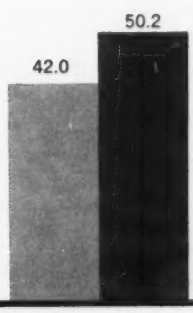
WELDABILITY—There is no difference in the welding of Hi-Qua-Led Steel forgings and regular forgings of the same grade. Hi-Qua-Led is approved for ASME Code welding *(Special Case Ruling No. 1253)*.

CHARPY IMPACT—For 1045 and 4140 series steels, Hi-Qua-Led Steel forgings exhibit better properties than their unleaded counterparts. In 4340, there is no difference between Hi-Qua-Led and regular forgings.

ALCO

EXCEPT BETTER MACHINABILITY

special process Hi-Qua-Led Steel®

	TENSILE STRENGTH (psi)	YIELD STRENGTH (psi)	DUCTILITY		RESULTS
			PER CENT ELONGATION	PER CENT RED. OF AREA	
					There is no significant difference between 1045 and 10L45.
					There is no significant difference between 4140 and 41L40.
					There is no significant difference between 4340 and 43L40.

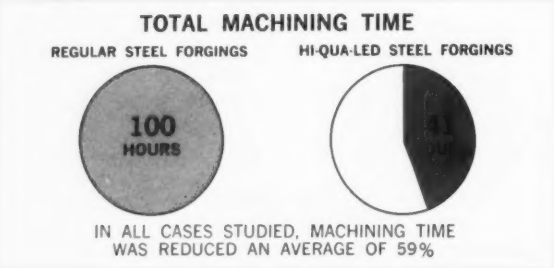
***The "L" designator in any AISI number denotes Hi-Qua-Led Steel. For example, AISI 1045 becomes 10L45 in Hi-Qua-Led Steel.**

For a report on Hi-Qua-Led Steel machinability, turn page . . .

HI-QUA-LED STEEL GIVES YOU MACHINING ADVANTAGES UNMATCHED BY ANY OTHER FREE-MACHINING STEEL

HI-QUA-LED STEEL REDUCES MACHINE TIME MORE THAN 50 PER CENT

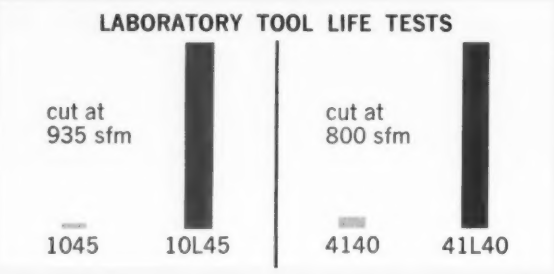
The submicroscopic addition of lead to Hi-Qua-Led Steel changes two basic machining factors. First, the shear angle is increased, reducing the heat generated and the force required for plastic flow. Second, frictional properties of the chip flowing over the tool are reduced, generating less heat and causing less chip welding, and further reducing the force requirement. These changes permit much higher speeds and feeds. Translated into machine time, in most cases they mean more than a 50 per cent saving, floor to floor.



IN ALL CASES STUDIED, MACHINING TIME WAS REDUCED AN AVERAGE OF 59%

HI-QUA-LED STEEL INCREASES TOOL LIFE UP TO 100 TIMES

In laboratory tests by a major tool maker, cutting at 935 sfm, a tool lasted one minute on standard 1045 and 100 minutes on Hi-Qua-Led 10L45 from the same heat. On standard 4140, at 800 sfm, a tool lasted one minute. On Hi-Qua-Led 41L40 from the same heat, at the same surface speed, the tool lasted 18 minutes. Of course, you probably won't cut Hi-Qua-Led at these speeds (although you can). But even at more normal speeds, customers report tool life increases of 200%, 700%, even 1600%.



HI-QUA-LED STEEL FORGINGS ARE MADE ONLY BY ALCO

There are many leaded steels on the market, but there is only one Hi-Qua-Led Steel. It is available only from ALCO, and only in forgings.

You can get Hi-Qua-Led Steel forgings in any steel grade. Each heat of ALCO steel is carefully made in 60-ton open hearths, assuring strict control of steel chemistry to specification.

For complete information on Hi-Qua-Led Steel's machinability and physical characteristics contact the nearest ALCO sales office, or send for the free 40-page reference booklet: "Technical Data, Hi-Qua-Led Steel Forgings." Write to ALCO Products, Inc., Dept. 159, Schenectady 5, N. Y.

SIZES AVAILABLE

Open die forgings—rectangular
Maximum width—48 in.
Maximum height—32 in.
Maximum length—40 ft
Maximum weight—36,000 lb
Minimum weight—1,000 lb

Open die forgings—shafts
Maximum OD—36 in.
Maximum length—40 ft
Maximum weight—36,000 lb
Minimum weight—1,000 lb

Mandrelled ring forgings
Maximum OD—82 in.
Minimum OD—24 in.
Maximum width—60 in.

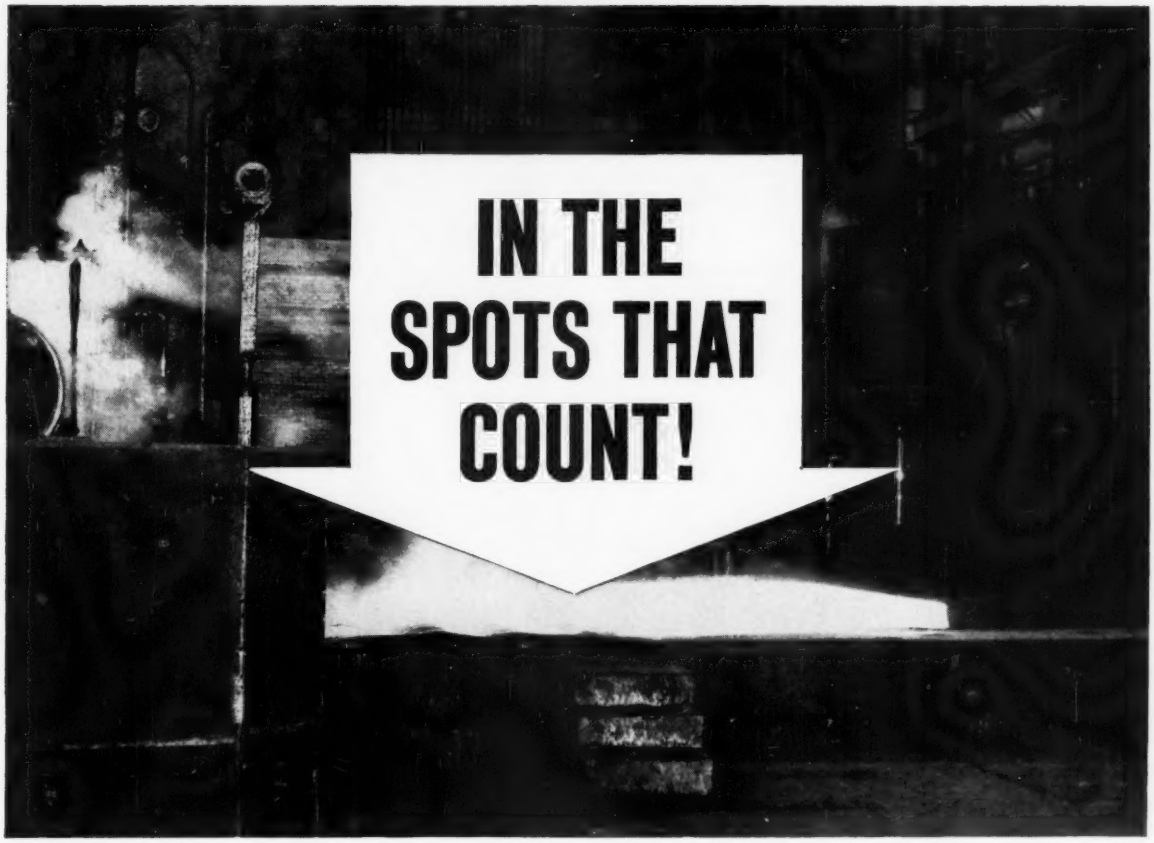
Rolled ring forgings
Maximum OD—160 in.
Minimum OD—18 in.
Maximum width—24 in.

See ALCO's *catalog in Sweet's Product Design Catalog File. See Thomas' Register for complete product listings and addresses.*

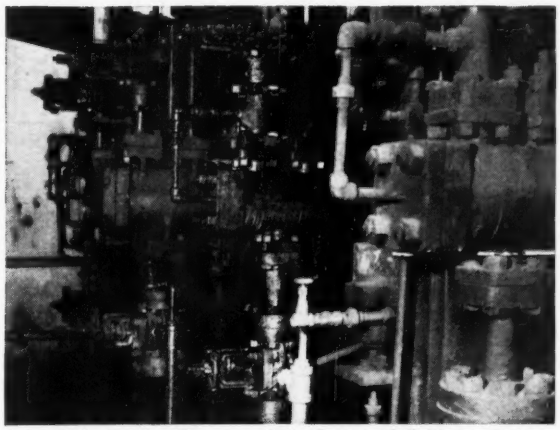
ALCO

ALCO PRODUCTS, INC.
NEW YORK
SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES • DIESEL ENGINES • NUCLEAR REACTORS • SPRINGS • FORGINGS • WELDMENTS • OIL FIELD EQUIPMENT



split-second control with Homestead® Operating Valves keeps steel plate rolling!



Solenoid-hydraulic pilot controlled 4" and 2½" Hydro-Cushion Homestead Operating Valves; and Lever-Seald Hydraulic Stop Valves; 800 pounds working pressure.

Six days a week, twenty-four hours a day, 250 times an hour, the tilt tables and middle roll of an East Coast Plate Mill are exactly positioned without shock, and held without creepage, by Homestead Operating Valves. This precision control has permitted record-breaking rolling of the hot steel slabs into plate.

Through more than *three and one-half million* split-second rollings during the two years the 2½" and 4" Hydro-Cushion Homestead Operating Valves have been in service, not one shutdown has been required for valve maintenance! Performance records such as these, are assured by the protected seat and cushioning action of the Homestead Valves.

For any hydraulic control problem, there is a Homestead Operating Valve to meet your needs. Send today for Reference Book 39-6.

Please send Reference Book 39-6 and prices on all types of Homestead Operating Valves. 98

Name.....Title.....

Company.....

Address.....

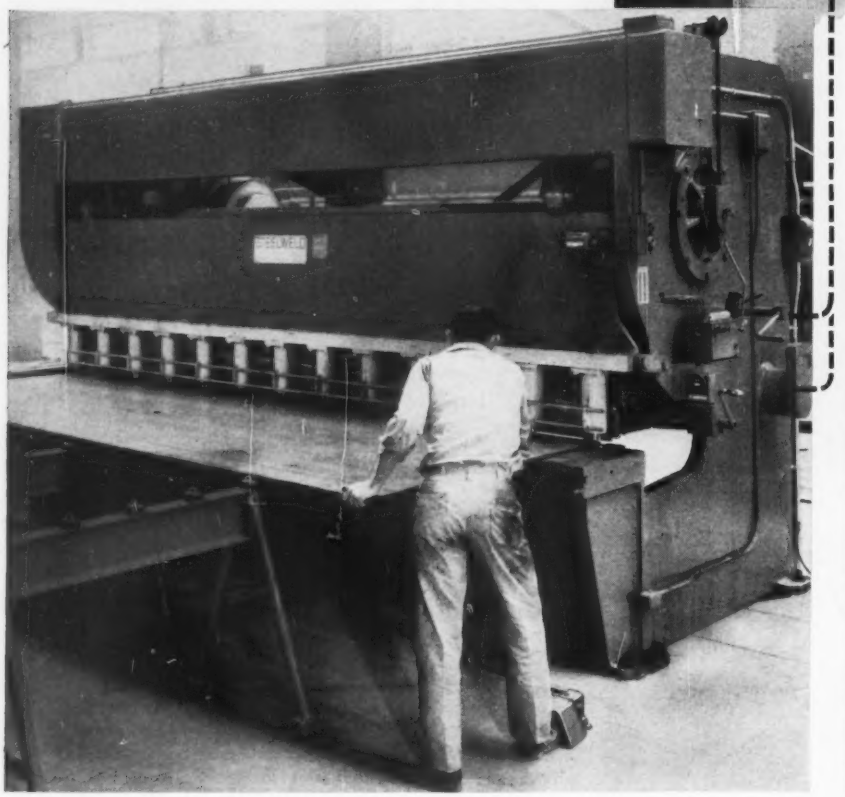
City.....Zone.....State.....

hv

HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. Box 98, Coraopolis, Pennsylvania

For The *Best Cut,* The CORRECT KNIFE CLEARANCE Must Be Used

Steelweld Shears are available for all thicknesses of steel to 2 inches and for lengths to 30 feet. Electric foot-switch operation, as illustrated, is furnished as standard equipment.



In 10 seconds the knife clearance on Steelweld Shears can be adjusted to suit the thickness of metal being cut. It's merely a matter of turning a hand crank until the gauge pointer is on the proper figure.

Table of Recommended Knife Clearances

Gauge	Steel	Stainless
10	.012	.007
8	.014	.009
3/16	.016	.010
1/4	.021	.014
5/16	.027	.018
3/8	.032	.022
1/2	.043	.029
5/8	.053	
3/4	.064	
7/8	.075	
1	.086	

FOR every plate thickness there is a definite space or clearance between the knives that will produce the best result. When cutting different thicknesses of metal, it is necessary to vary the knife clearance accordingly.

One of the important differences between Steelweld Pivoted-Blade Shears and all others is the ease with which the knife clearance can be adjusted on Steelwelds. With most shears this is a major operation involving the use of measuring devices and requiring a great deal of time. Steelwelds were designed to make this adjustment simple, easy and fast. Hours of work are not required, in fact, the adjustment for any plate thickness can be made in 10 seconds.

Obviously there is no need to shear with some compromise knife clearance setting when you have a Steelweld Shear. You do not have to accept any average cut when with such little effort you can have the best possible cut every time—sharp, straight, accurate with minimum burr. And then, too, remember that knives stay sharp longer when the proper clearance is used.

Easy knife adjustment is only one of many fine features that you will like in Steelweld Shears. For all thicknesses of plate up to 2 inches, for all lengths to 30 feet, you will find Steelwelds have much to offer.

Write for free copy of Catalog No. 2011.
Gives construction and engineering details

STEELWELD

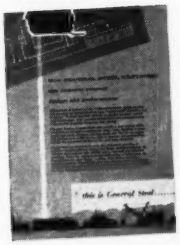
PIVOTED BLADE **SHEARS**

STEELWELD DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7855 E. 282ND ST. • WICKLIFFE, OHIO

...where industrial progress is cast in steel

Accurate measurement of ingredients and periodic analysis insure the correct chemistry for the many different alloys produced at General Steel

METALLURGICAL SERVICE... EXPERT ANALYSIS AND COUNSEL



Write for folder: **How General Steel Castings Can Improve Product Design and Performance.** General Steel Castings, Station 230 Granite City, Illinois.

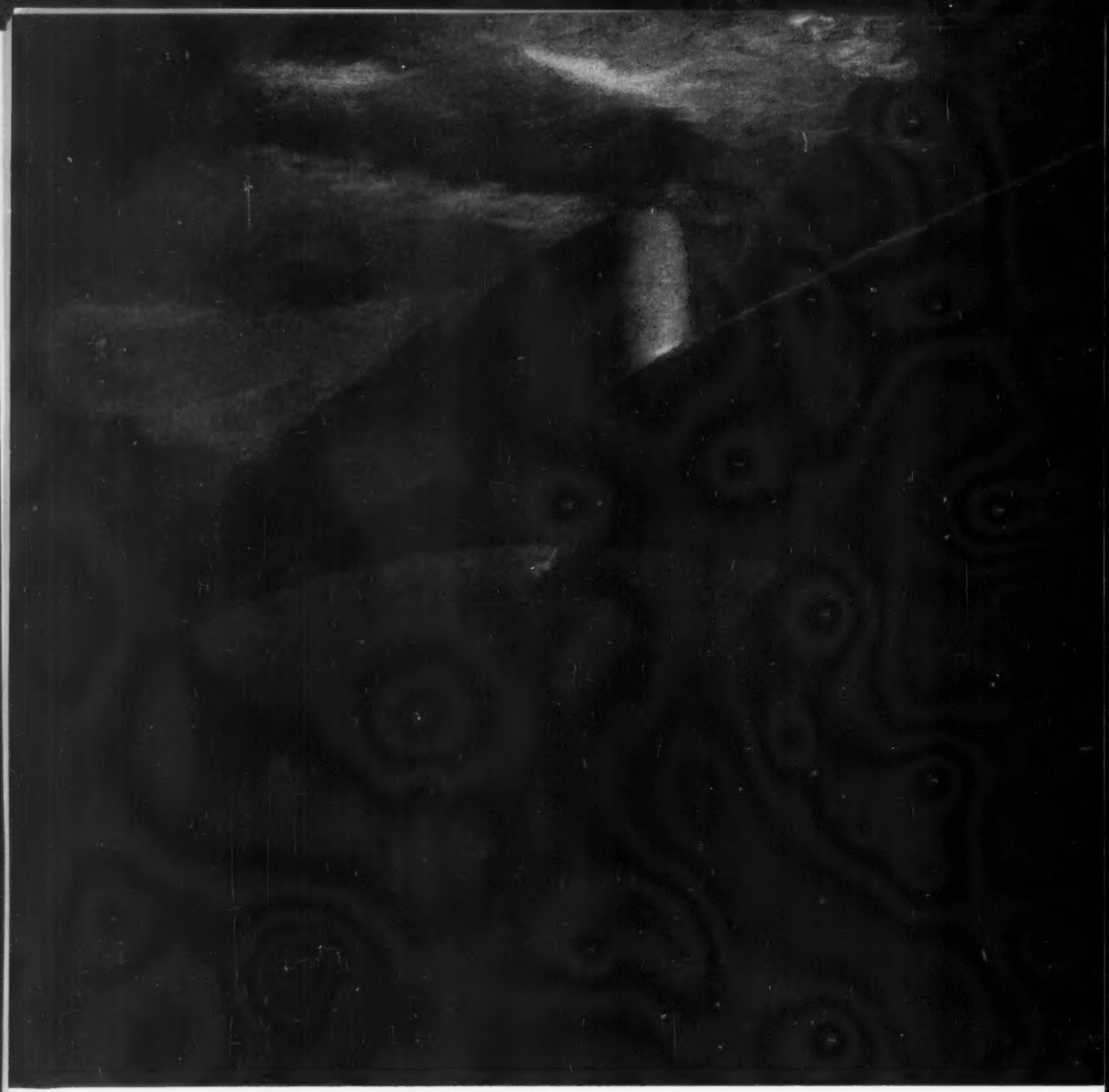
Optimum design in cast steel structures for your products can be gained only through application of a *complete* range of services. One of these is our metallurgical service consisting of expert counsel and accurate control of steel analysis... another area in which General Steel is well equipped and staffed.

This expert metallurgical counsel and the facilities of each of our laboratories are available for solving metallurgical problems for customers.

A vast backlog of knowledge and experience is available to you. Let us work with you from the "raw-idea" stage... in this way you benefit from our complete services from creative analysis and engineering to follow-through of performance in the field.

GENERAL STEEL CASTINGS

GRANITE CITY, ILL. · EDDYSTONE, PA. · AVONMORE, PA.



Eyes of the fleet

To search out the enemy task force, and act as a mobile early warning station. This is the mission of the Triton — the Navy's largest submarine and the newest atomic-powered member of the Silent Service.

Measuring 447 feet in length, the Triton, built by General Dynamics Corporation's Electric Boat Division, is officially known as a radar picket submarine.

The Triton carries with her two contributions from National Tube—National Seamless Pipe and Tubes in both carbon and stainless steels and National Seamless Steel Cylinders. National Seamless Steel Cylinders are used to house compressed oxygen and to store compressed air for torpedo firing.

This is another significant achievement for National

Tube. In almost every type of tubular installation aboard ship, from stem to stern, you'll find National Tube is more than qualified to handle your most difficult problems. Remember, for more than 80 years, National Tube has been a leader in the manufacture of tubular products for all types of building and industrial uses generally. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

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National Tube Division of USS United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

CF&I

Reels
(500-800 lbs. capacity)

Disposable Spools
(5-70 lbs. capacity)

Fibre Drums
(250-600 lbs. capacity)

Standard Coils, paper-wrapped, steel-strapped or wire-tied

WIRE...

PACKAGED for YOUR PRODUCTION

The CF&I Image represents the strength and dependability of all CF&I steel products. And for CF&I Steel Wire, this symbol reflects top quality. CF&I is the leader in designing packaging to reduce our customers' costs.

This is important to you! When you buy CF&I Steel Wire, you cut production costs—save time and money—by specifying the package that works most economically for you. You can choose a CF&I wire package that gives you the following special benefits:

- *reduced downtime through extra long lengths of wire*
- *simplified inventory control*
- *fast, economical in-plant handling*
- *continued cleanliness of the wire*

CF&I Steel Wire is available in a wide variety of gages and finishes. Whatever your wire requirements, be sure to order from CF&I. All orders—from a coil to a carload—will arrive at your plant packaged for your production. Let our nearest sales office know your requirements.

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In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans New York • Philadelphia

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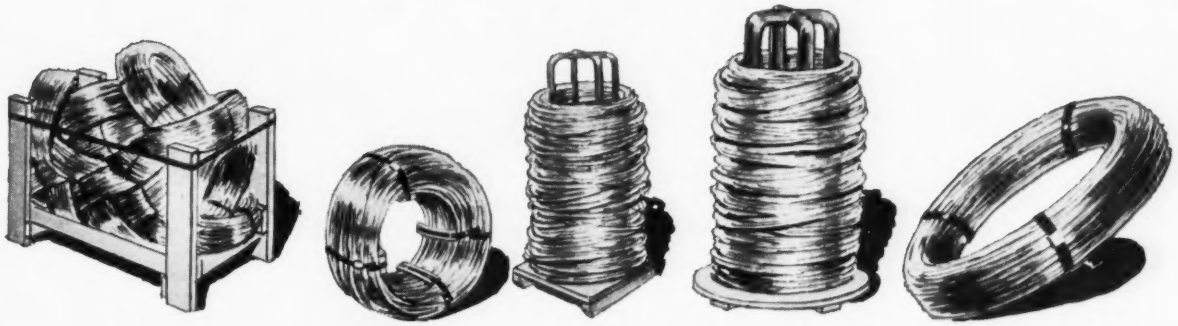
CF&I STEEL



Steel-strapped Wooden Racks | Shaped Coils (1500-2500 lbs. capacity) | Stem-paks (500-700 lbs. capacity) | Returnable Spiders (2000-3000 lbs. capacity) | Steel-strapped Coils (100-600 lbs. capacity)

6626

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Fast to find hidden clues to savings in packaging . . . that's your G-Man*. Just call him to the scene; he'll pick up the trail from there. He comes up with refreshing new solutions to protection, packing, shipping problems . . .with corrugated boxes.

Whether you need regular containers in big volume or specially engineered packaging, call in this modern Sherlock now. He's keen-eyed, ready—and nearby.

**Your Gaylord Man—of course*

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CONTAINER CORPORATION

Gaylord Boxes

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**

ONLY ALCOA ECONOMY BOLTS GIVE YOU A TIGHT GRIP ON COSTS, TOO

If you want to get tight-fisted about fastener costs . . . without sacrificing product quality . . . better turn to Alcoa® Aluminum economy bolts. Bright and flawlessly finished, they cost less than any other corrosion-resistant fastener. Order them for practically any general application where you now use more expensive trimmed-head bolts. They'll add extra sales appeal to your product *at no extra cost.*

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Gentlemen: Please send complete specification data and samples of Alcoa Aluminum Fasteners.

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Join the Big Switch to Republic

ELECTRUNITE

HYDRAULIC FLUID LINE TUBING

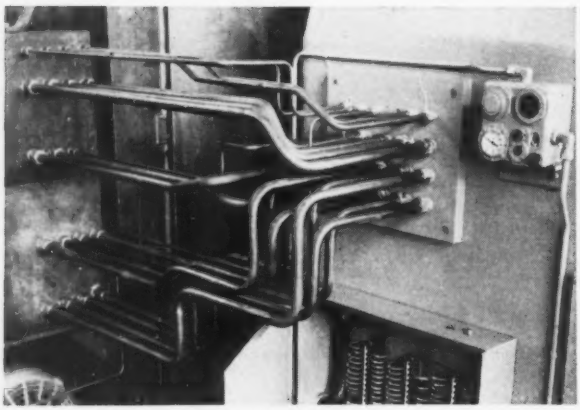
HIGH DUCTILITY assures easy bending in any plane. ELECTRUNITE's uniformly high ductility is the result of double-annealing.

Get more tube per dollar . . . Now Electric Resistance Weld Steel Tubing included in JIC Standards . . .

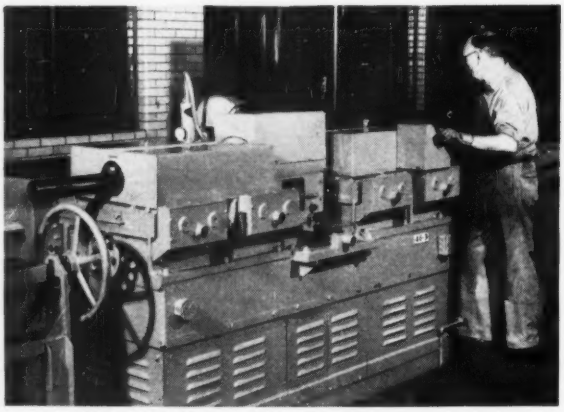
Join the hundreds of manufacturers using millions of feet of Republic ELECTRUNITE® Hydraulic Fluid Line Tubing. As a result of their own tests, many equipment and machinery builders and their maintenance departments switched to this quality-proved hydraulic tubing prior to its being included in the JIC Standard.

Like them, you'll get *more tube per dollar* when you specify Republic ELECTRUNITE Hydraulic Fluid Line Tubing. But initial cost savings are only part of the story. *Savings in downtime* reflect even greater cost reductions!

ELECTRUNITE—produced by the world's largest manufacturer of electrically welded hydraulic tubing—is made from flat-rolled steel. *Prime* steel—checked for defects as only flat-rolled steel can be checked. Then: formed, welded, annealed,



READILY ASSEMBLED—close dimensional tolerances maintained in the drawing of ELECTRUNITE Hydraulic Fluid Line Tubing assure lower-cost installation.



QUALITY YOU CAN MEASURE! Specify FARROWTEST® non-destructive electronic testing to MIL-T-17188 or ASTM-A-178 for extremely critical applications. Offered as an alternate to hydrostatic testing.

ELECTRUNITE IS EASILY FLARED to accommodate standard flare-type fittings.

cold-worked, and annealed again into a tube of *prime* quality . . . a tube that meets or exceeds the normal life of tubing produced by any other method.

ELECTRUNITE'S uniform walls and concentricity, coupled with uniformly high ductility, assure better bending and flaring characteristics. In the *history* of ELECTRUNITE Hydraulic Fluid Line Tubing, no failure resulting from longitudinal or transverse cracks has been reported.

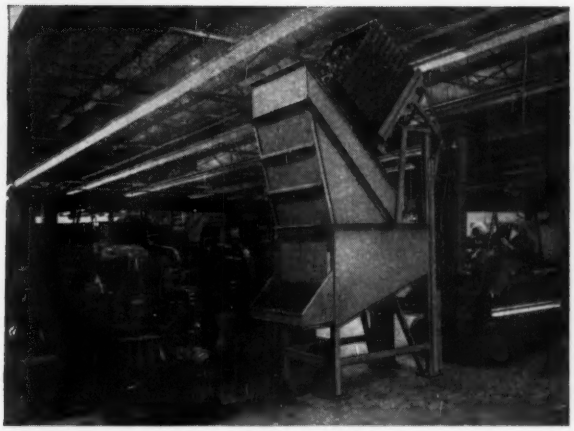
You'll find that ELECTRUNITE Fluid Line Tubing is available in all the sizes shown in the *JIC Standards Book.* Also available in an even wider range of sizes produced to our specification HL-1 (which meets all test requirements of the JIC Standard).

Investigate ELECTRUNITE'S many cost-reducing features. Contact your ELECTRUNITE sales representative or mail the coupon for complete information, including a copy of specifications.

AVAILABLE IN ALL SIZES SHOWN IN JIC STANDARDS BOOK. AVAILABLE IN A WIDER RANGE OF SIZES PRODUCED TO OUR SPECIFICATION HL-1 (WHICH MEETS ALL TEST REQUIREMENTS OF THE JIC STANDARD).

REPUBLIC STEEL

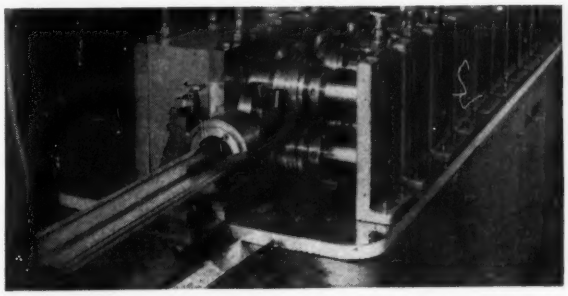
World's Widest Range of Standard Steels and Steel Products



ENGINEERED FOR LONG LIFE, Republic Skid Boxes have corrugated construction, smooth double roll around top that eliminates sharp edges. Four-way fork entry, which simplifies handling, is available. Heavy-duty stacking brackets permit tiering to any practical height. For the latest materials handling ideas, consult Republic Materials Handling specialists. Send coupon.

REPUBLIC'S NEW HIGH STRENGTH POWDER, TYPE HS6460,

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Less than .004% shrinkage from die size at 6.4 density. Can be used with existing operating equipment. Available in quantities up to and including 12 tons or multiples. Send for technical data sheet.



SAVE PAINT PREPARATION COSTS on your formed steel products by specifying Republic Electro Paintlok®. Special paint-holding surface applied at our mills won't crack, flake, or peel—even under severe bending—as demonstrated by this acoustical panel forming operation. Final finish can be applied immediately, with excellent results. Mail coupon for complete information.

REPUBLIC STEEL CORPORATION
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Please send more information on:
☐ ELECTRUNITE Hydraulic Fluid Line Tubing, including a copy of specifications
☐ Republic Materials Handling Equipment
☐ Republic Electro Paintlok ☐ Type HS6460 Metal Powder

Name_____ Title_____
Company_____
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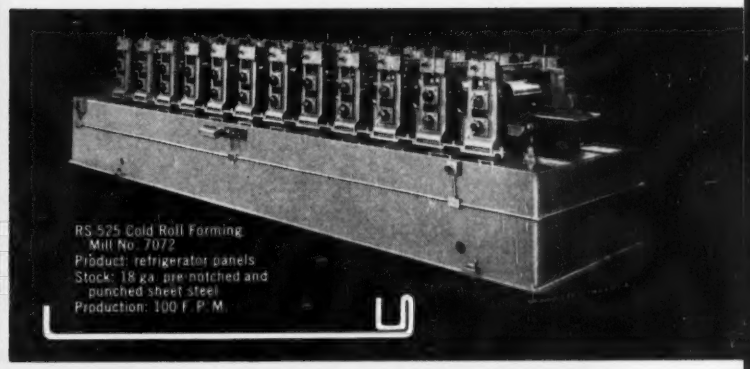
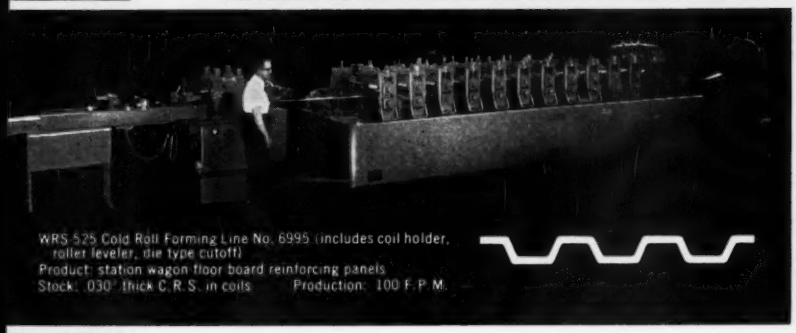
Roll forming upswing.....

Recently installed in the plant of one of America's leading steel companies was this McKay cold roll forming line for the forming and cutting to length of industrial shelving angles up to .116" mild steel strip with pre-notched holes for joining. Line is composed of double rotating coil holder, roller leveler, pre-notching press, forming machine, cut-off, run-out and kick-off table.

Completely Automatic Rim Rolling Line No. 6798
Product: automobile and farm implement drop center wheel rims
Stock: welded steel bands
Production: 600-900 Rims per hour



RS 525 Cold Roll Forming Mill No. 7072
Product: refrigerator panels
Stock: 18 ga. pre-notched and punched sheet steel
Production: 100 F. P. M.



WRS 525 Cold Roll Forming Line No. 6995 (includes coil holder, roller leveler, die type cutoff)
Product: station wagon floor board reinforcing panels
Stock: .030" thick C.R.S. in coils Production: 100 F. P. M.

WRS-653 Cold Roll Forming Line No. 7229 (4) (includes coil holder, roller leveler, die type cutoff)
Product: bar joist channels
Stock: ⅛" to ¼" thick h. r. low-carbon steel in coils
Production: 100 F. P. M.

WRS-420 Cold Roll Forming Line No. 7118 (includes coil holder, roller leveler, pre-notching press, die type cutoff)
Product: structural angles and channels
Stock: 16 ga. to 11 ga. h. r. and c. r. low C steel in coils
Production: 100 F. P. M.

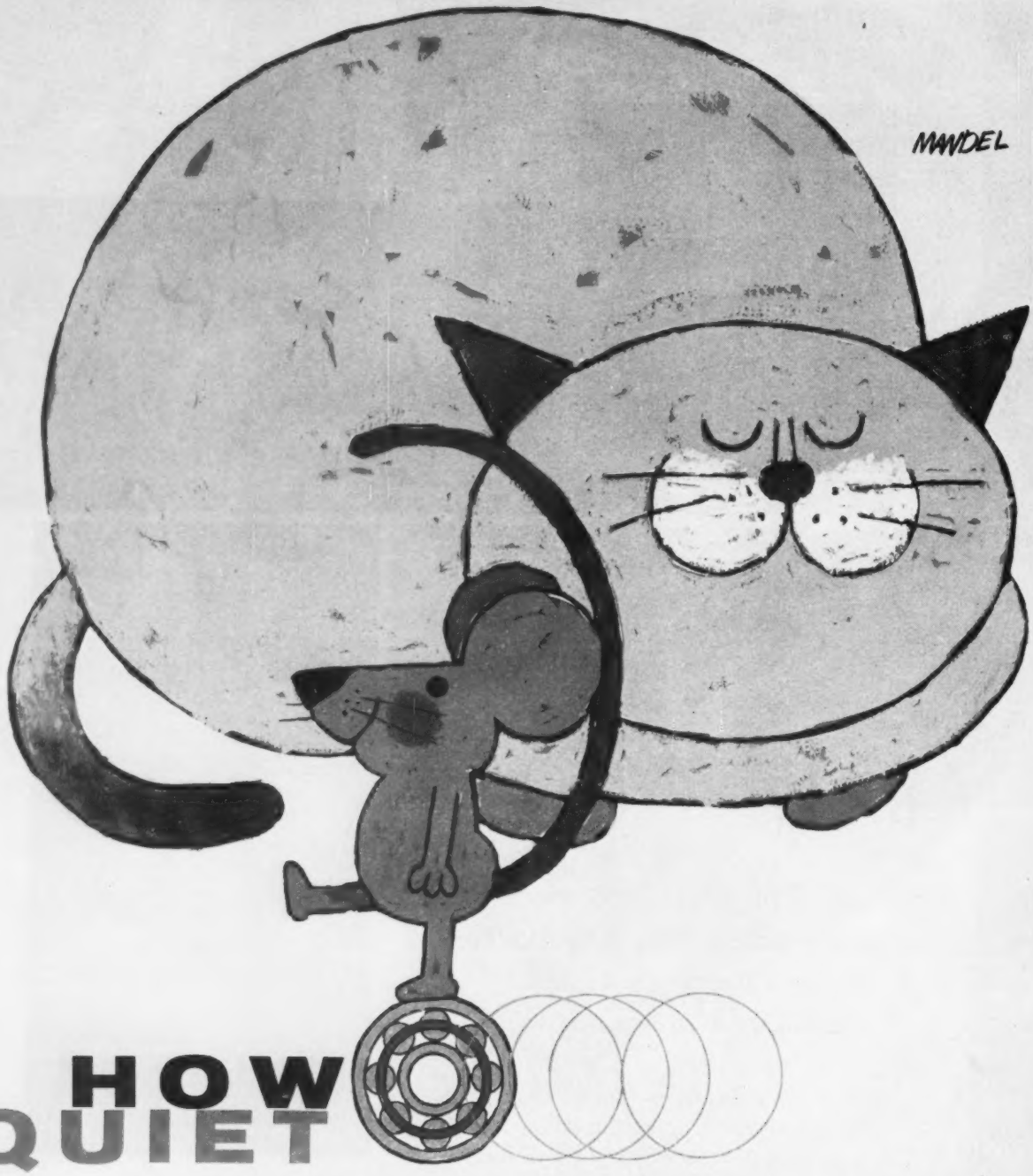
Manufacturers of all kinds of products look to McKay Machine for roll forming equipment to lower man-hour costs!

To increase man-hour production, manufacturers are turning to the automated roll forming line. In recent years McKay Machine engineers have developed equipment that enables fabricators to produce more and more products in a continuous stream directly from coiled stock.

From drop center wheel rims and station wagon floor boards to finished refrigerator parts, manufacturers are finding roll forming gives them greater production control and product uniformity while eliminating many costly intermediate manufacturing functions.

Analyze your production—there may be a way you can take advantage of roll forming economies. To help you, why not rely on the 20 years of roll forming leadership of the *McKay Machine Company, Youngstown, Ohio.*

McKAY MCK MACHINE



HOW QUIET can a ball bearing be?

Federal Ball Bearings are to be seen, but not heard! Elusive noises are intercepted by inspection engineers at "quiet control" points all along our production line. They want to hear the soft, sweet purr that signifies a perfect bearing, because that's the only kind we'll tolerate. That's why every bearing goes through scores of quality control tests before we send it out. Customers who get these perfect bearings number among the most respected names in American industry. We'd like to include you. Start with our catalog—over 12,000 ball bearing sizes, hundreds of types. Send for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

Federal
BALL BEARINGS

One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

POSITIVE DUPLICATION – EVERY TIME!

From a given point, the needles of these compasses always point to the earth's magnetic poles . . . an important aid to exploration and navigation.

The (PD)° marking on these CINCINNATI Surface Grinding Wheels (and *all* CINCINNATI WHEELS) points to an important and remarkable quality . . . Positive Duplication, time after time after time.

CINCINNATI (PD) WHEELS do a better job for you, because 36 separate quality control steps in the unique (PD) process result in wheels of unsurpassed uniformity.

UNIFORMITY TO YOUR ADVANTAGE

Perhaps every wheel manufacturer has complained about the weather and its changing effects on the product. But Cincinnati has followed Mark Twain's advice and has done something about the weather.

Temperature and humidity of the Mold Room are controlled at exact, unchanging levels—every hour of every day *throughout the year!* In addition, (PD) vitrified wheels are fired in a tunnel in unvarying conditions of atmospheric control at critical sections within the kiln.

Result: Each of your re-order (PD) wheels will act and grind exactly like the original wheel.

CALL CINCINNATI

For experienced help in cutting costs, in grinding machine setups and operations, there are Cincinnati grinding specialists available to you. Call your CINCINNATI (PD) GRINDING WHEELS distributor, today, or contact Cincinnati Milling Products Division, Cincnnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI®
GRINDING WHEELS

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

°Trade Mark Reg. U.S. Pat. Off.

This same water does a big job at our new plant!

You'll find high production and pleasant living side by side in North Carolina's northeastern corner. Rivers and lakes where big bass lurk also provide abundant industrial water.

And at Roanoke Rapids, they turn the turbines that add an extra 100,000 kilowatts to Vepco's fast growing power capability. There's over 1,700,000 kilowatts available for your new plant now . . . building toward 2,000,000 kilowatts by 1961.

For more facts about this land of mild climate, many resources and plentiful, home-grown manpower . . . or for confidential site-finding help . . . write, wire or telephone VEPCO today.

50 since 1909-1959 — 50TH YEAR

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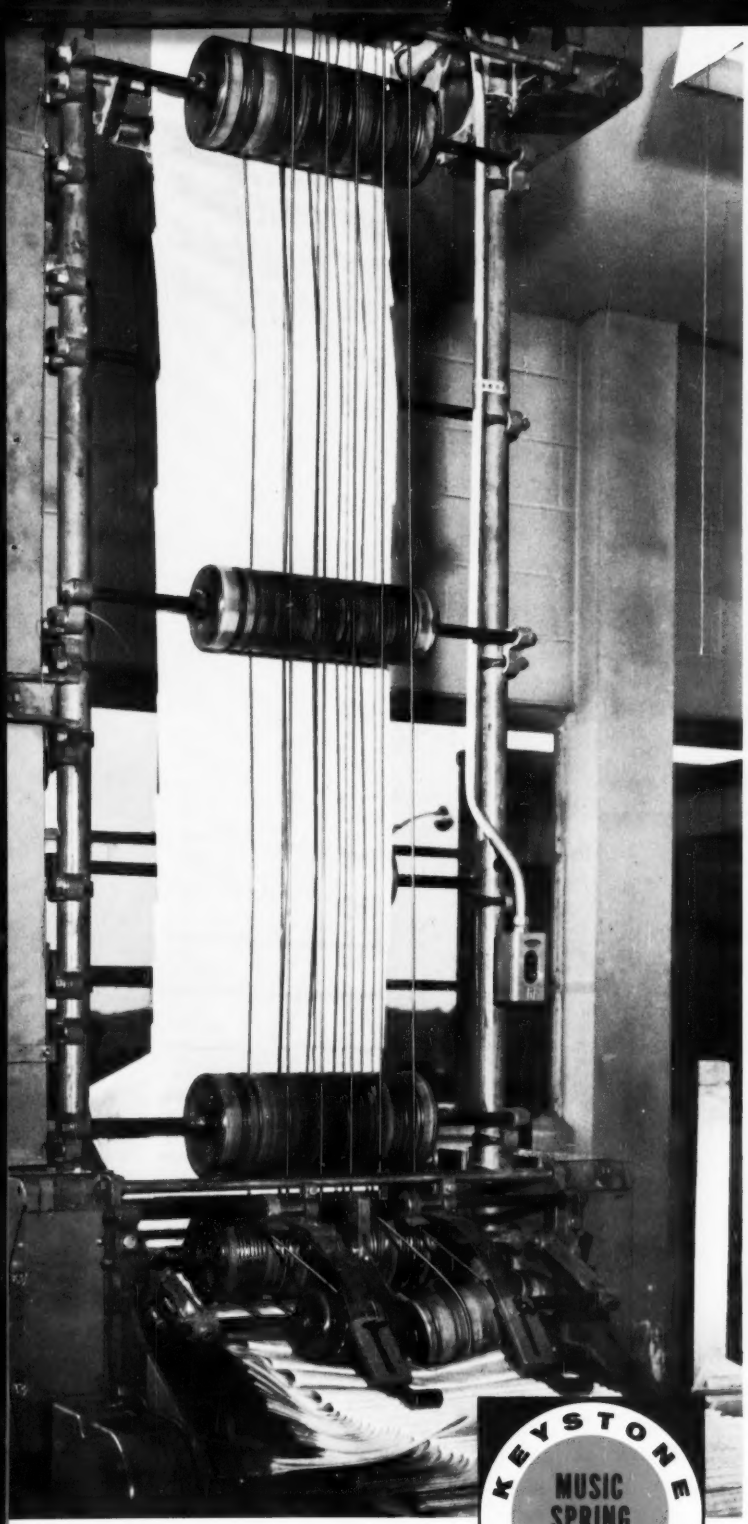
Serving the Top-of-the-South . . . in Virginia, West Virginia and North Carolina

Clark P. Spellman, Mgr., Area Development, Electric Bldg., Richmond 9, Va., MI 9-1411



CARRYING THE NEWS on a

CUTLER-HAMMER CONTROL C-H

wire belt

Keystone Music Spring Wire used in Cutler-Hammer newspaper conveyors delivers newspapers from the presses on time, all the time.

Folded newspapers—varying from a few pages to extra thick editions ride directly from the high-speed press, between endless coiled wire belts made from specially processed Keystone Music Spring Wire. The papers are lifted straight up, carried overhead and conveyed to the delivery room. The flexibility in the design of the Cutler-Hammer conveyor with its coiled springs permits turns and bends as required by the installation.

Failure of a single spring could mean a deadline missed. It is for this reason that Cutler-Hammer uses Keystone Music Spring Wire—a wire that creates owner satisfaction.

Despite comparatively severe and small radius bends required to form the belts, Keystone Music Spring Wire runs smoothly and flawlessly through the forming machines at Cutler-Hammer.

Keystone Music Spring Wire is successfully used in many other applications requiring high quality, high strength and extreme fatigue resistance.

This same kind of production advantage and customer acceptance can be of value to you and your product. It only takes a telephone call to your Keystone representative to learn the details.

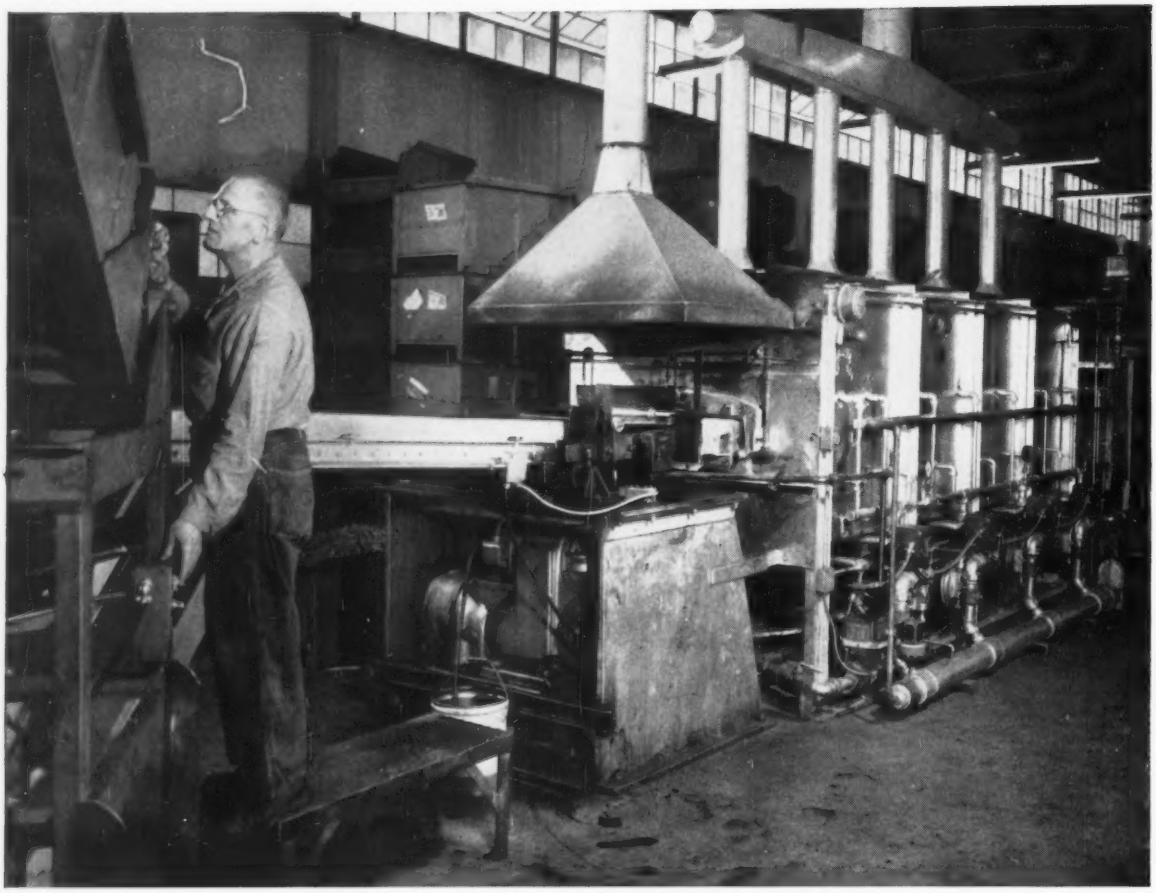
Keystone Steel & Wire Company, Peoria 7, Illinois

This battery of Cutler-Hammer newspaper conveyors was recently installed at the modern plant of the Peoria Journal Star, Peoria, Ill.

KEYSTONE MUSIC SPRING WIRE STUDY

KEYSTONE

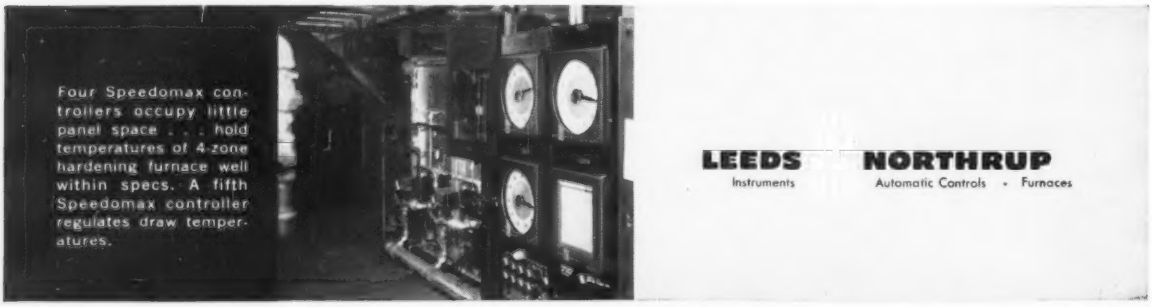
WIRE FOR INDUSTRY



Lamson & Sessions Co.: Operator checks loading of furnace used to harden bolts made of 1038, 1335 and 4140 steel.

Reproducibility of hardening temperatures a problem?

Not at Lamson & Sessions Co.'s Chicago plant, where Speedomax® H controllers are helping to assure reproducibility of hardening specs for nuts and bolts. With competition keen, dependability and reproducibility of processing equipment is a "must". Since installation nearly two years ago, Speedomax H has been controlling temperature of hardening and draw furnaces 5 days/wk, 24 hrs/day. Weekends, furnaces idle at control temperature. Maintenance has been negligible . . . temperature always within specs. Rugged, compact and completely reliable, Speedomax H is providing the same dependable control on numerous heat treat operations . . . is helping produce both process economies and a quality product. *Whatever your heat treating process, it'll pay you to investigate Speedomax H!* For details, contact your nearest L&N office or write 4956 Stenton Ave., Phila. 44, Pa.

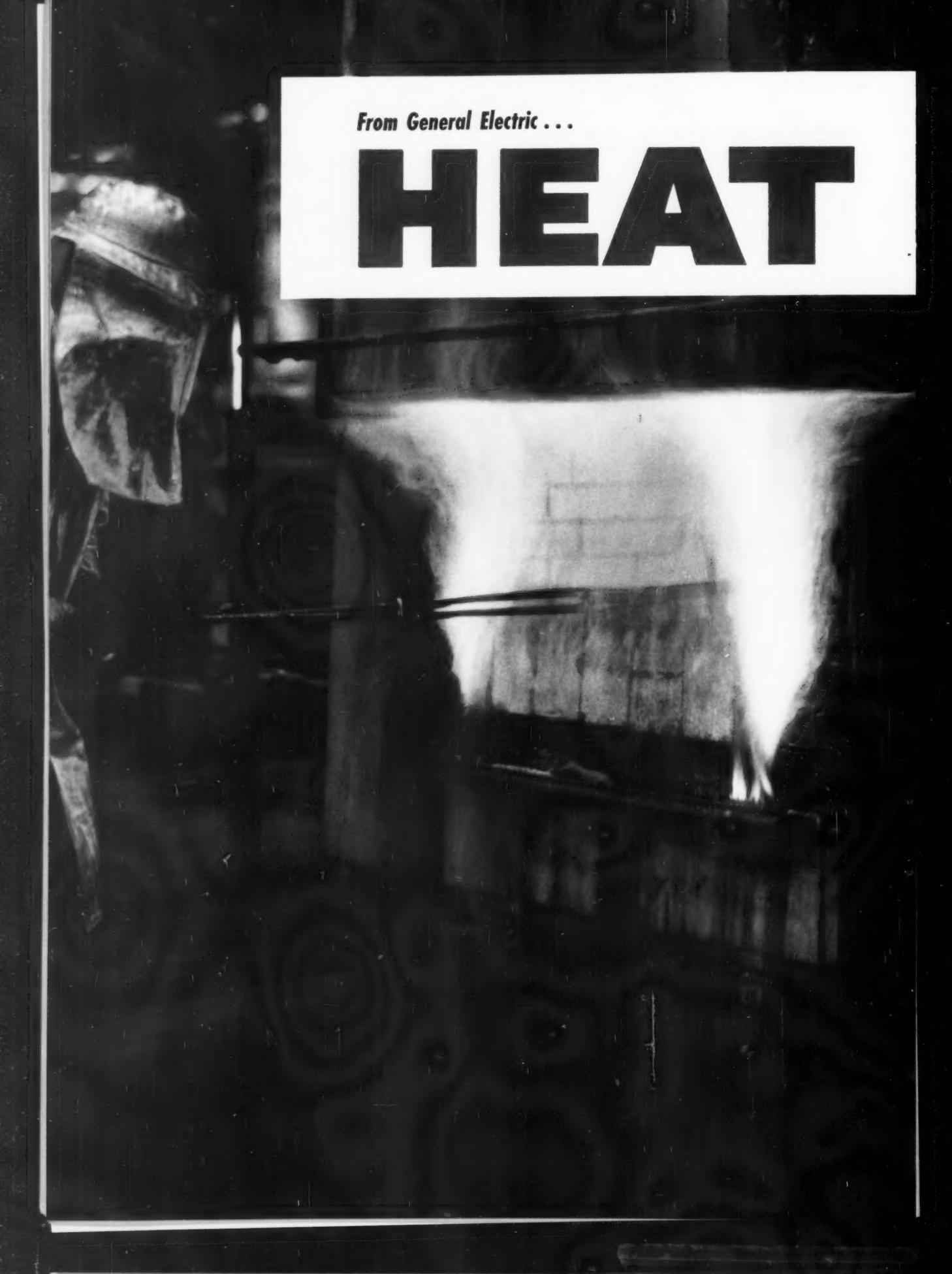

Four Speedomax controllers occupy little panel space . . . hold temperatures of 4-zone hardening furnace well within specs. A fifth Speedomax controller regulates draw temperatures.
LEEDS NORTHRUP
Instruments
Automatic Controls • Furnaces

A new division of
The Dow Chemical Company—

THE DOW METAL PRODUCTS COMPANY

Here's significant news for everyone who has an interest in metals and metal fabrication. The Dow Chemical Company, pioneer developers of Magnesium and Magnesium products, is now broadening its activities in metal working. A new division, THE DOW METAL PRODUCTS COMPANY, has been formed to specialize in the semi-fabrication and fabrication of not only Magnesium, but aluminum and other metals. This new division has excellent production facilities, plus knowledge gained through Dow's many years' experience in the metal working field. Facilities include plants for the manufacture of rolled and extruded products, sand and permanent mold castings, die castings, and fabricated assemblies.

DOW **THE DOW METAL PRODUCTS COMPANY**
DIVISION OF THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN


From General Electric . . .
HEAT

GENERAL ELECTRIC DESIGNS NEW FURNACE FOR HIGH-TEMPERATURE VACUUM OPERATIONS

Versatile new radiation shield furnace breaks heat barriers of conventional furnaces for critical super-alloy heating jobs

These new General Electric radiation shield furnaces give you faster heating and cooling cycles than you can obtain with your present hot retort furnaces. But in addition, they offer unmatched versatility for your future heating needs which hot retort furnaces can't possibly handle.

G-E radiation shield furnaces have been designed to operate from 1900 F to 2600 F, and in smaller sizes up to 4200 F. They can be used with vacuum, or with inert or hydrogen atmospheres. They are readily adaptable for the heat treatment, brazing and sintering of super-alloy stainless steel, and metals like titanium and zirconium.

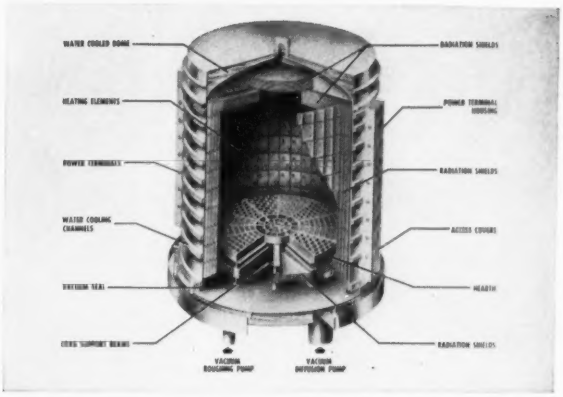
In addition to the versatility of higher temperatures and atmospheres, there's no metal retort between the heating units and the work in a radiation shield furnace. You get fast heating. And rapid cooling rates are provided by G.E.'s new cooling system that allows rapid recirculation of the cooling medium. Because of the more rapid heating and cooling cycles, a single radiation shield furnace can often do the work of a hot retort furnace with two bases and retorts . . . and give you substantial savings in floor space.

If you heat treat super alloys, seriously consider the advantages of a new G-E radiation shield furnace. You'll find General Electric engineers have the knowledge and design skill to match a furnace to your needs. Call your G-E Heating Specialist. Contact your nearby General Electric Apparatus Sales Office, or write Section 721-24, General Electric Company, Schenectady 5, New York.

GENERAL ELECTRIC

TYPICAL APPLICATIONS	Stress Relief	Annealing	Brazing	Sintering	Solution Heat Treatment	Degassing
Stainless Steels	X	X	X	X	X	X
Super Alloys	X	X	X	X	X	X
Tungsten	X	X	X	X	X	X
Tantalum	X	X	X	X	X	X
Molybdenum	X	X	X	X	X	X
Columbium (niobium)	X	X	X	X	X	X
Titanium	X	X	X	X	X	X
Vanadium	X	X	X	X	X	X
Zirconium	X	X	X	X	X	X
Hafnium	X	X	X	X	X	X

***Chart shows wide range** of applications possible with G.E.'s new radiation shield furnace; typifies G.E.'s ability to provide correct heat treating equipment to meet almost every need.*



***The new radiation shield furnace** is another example of General Electric pioneering in the field of high-temperature heat treating. This furnace is rated from 1900 to 2600 F, in smaller sizes up to 4200 F.*

FROM THE WORLD'S LARGEST

A NEW LOW COST THREAD ROLLING MACHINE

THREADING EQUIPMENT MANUFACTURER

LANDIS Research has now developed the LAN-NU-ROL Thread Rolling Machine—designed to meet the requirements for jobbing or high production thread rolling operations.

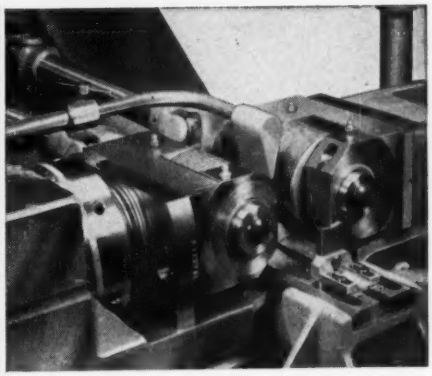
Low cost and economical to operate, the cylindrical-die LAN-NU-ROL Machine is a perfect complement to the larger, heavy-duty LANHYROL Thread Rolling Machine that has been producing unequalled results for several years. The LAN-NU-ROL's design concept is formed on the bases of simplicity, rigidity, power, accuracy, versatility, low first cost, low die cost, and uncomplicated set-up and service.

The LAN-NU-ROL Thread Rolling Machine produces strong, accurate threads of excellent finish by the chipless cold-forming process. It is ideally suited for Thru-Feed Rolling and a full complement of automatic feeding is available for threading by this method. Although intended primarily for hand-loaded Infeed Rolling operations, automatic feeds can be supplied for Infeed Rolling wherever practical. The LAN-NU-ROL will thread all diameters up to 2" by Infeed Rolling and up to 1" by Thru-Feed Rolling, depending on workpiece material and thread specifications. It will produce left- and right-hand threads of all types (except square), including UNC, UNF, Acme, Worm, and many special forms.

For additional information—please send specifications and ask for Bulletin E-101.

LANDIS *Machine* COMPANY
WAYNESBORO • PENNSYLVANIA

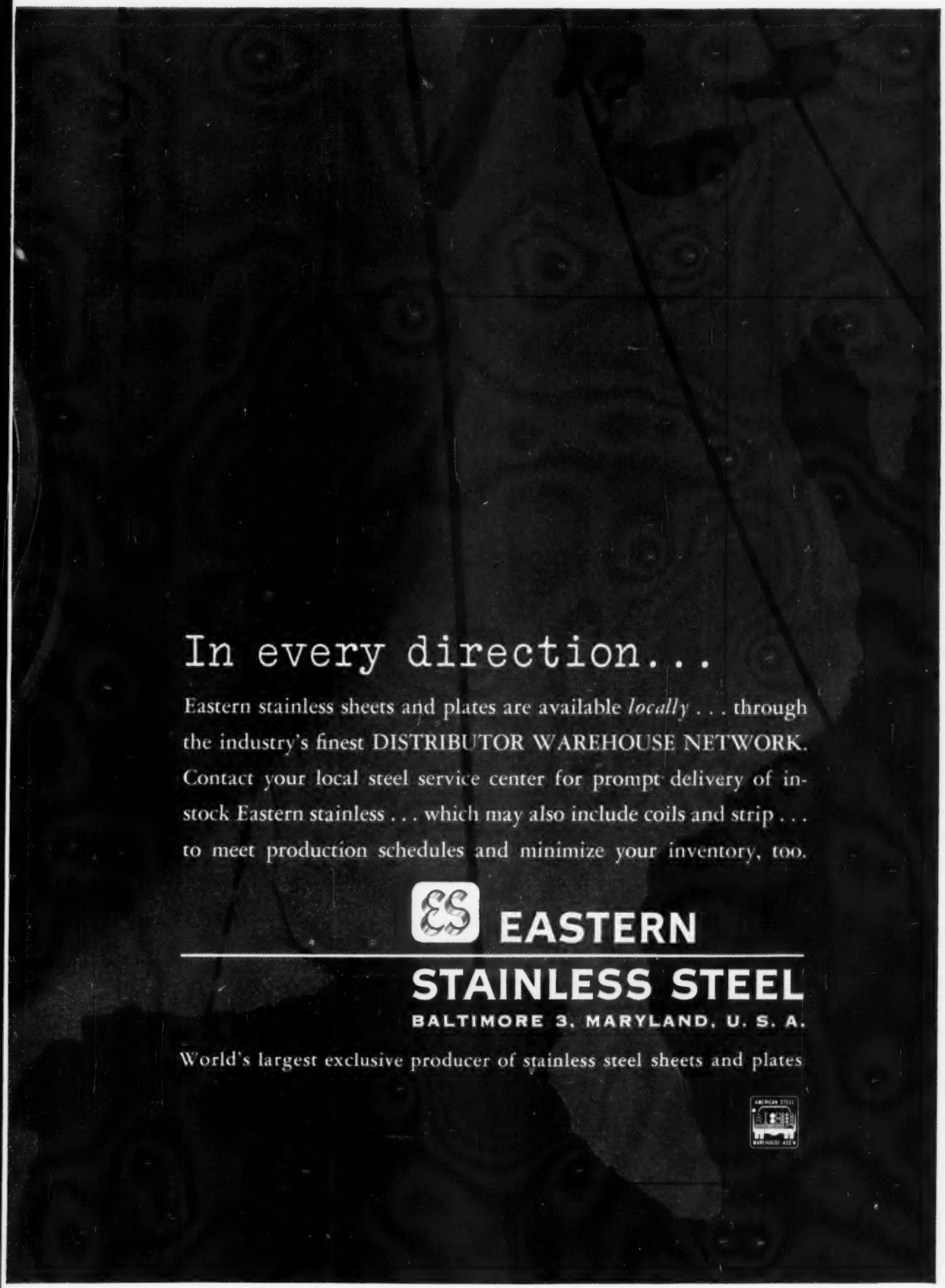
562C



DESIGN FEATURES

- **WIDE DIAMETRICAL RANGE**—up to 2" by Infeed Rolling and 1" by Thru-Feed Rolling, depending on workpiece material and thread specifications.
- **TWO-DIE DESIGN**—minimizes die cost, set-up time and auxiliary equipment.
- **PNEUMATICALLY-OPERATED**—hydraulically-operated (optional) . . . allows a high infeed cycling rate . . . up to 60 per minute; can be operated from plant air supply.
- **MANUAL, SEMI-AUTOMATIC AND AUTOMATIC DIE CYCLING**
- **AUTOMATIC FEEDING EQUIPMENT**
- **TOGGLE-OPERATED INFEED SYSTEM**—develops brute rolling pressure with maximum thermal stability and minimizes stress deflections.
- **INFINITELY VARIABLE SPINDLE SPEEDS**—166 to 500 RPM.
- **INCLINABLE ROLL HOLDERS**
- **SIMPLE, HIGHLY-EFFICIENT WORM-GEAR DRIVE TRANSMISSION**
- **INTERCHANGEABLE TOOLING SYSTEM**
- **EASY SET-UP AND SERVICING**

MARINER'S COMPASS, patented 1835 by Jonathan Ball, courtesy of The Smithsonian Institution


In every direction...
Eastern stainless sheets and plates are available *locally* . . . through the industry's finest DISTRIBUTOR WAREHOUSE NETWORK. Contact your local steel service center for prompt delivery of in-stock Eastern stainless . . . which may also include coils and strip . . . to meet production schedules and minimize your inventory, too.
EASTERN
STAINLESS STEEL
BALTIMORE 3, MARYLAND, U. S. A.
World's largest exclusive producer of stainless steel sheets and plates

QUALITY RINGS TRUE

Snap rings are one of the most elementary of fasteners — yet are called upon to play vital roles in the assembly of thousands of products. This is why there can be no sacrifice of quality when you specify snap, bearing, lock or retainer rings for your products. For unless the rings you specify do their job well — literally hold your products together — the result can only be loss of customer satisfaction. Your best assurance of quality is the reputation of the company who supplies your rings. Eaton's Reliance Division handles every step in the fabrication of rings from the cold finishing of the spring-quality steel through the forming, heat treating and finishing. Every step is guarded by an exacting quality control program that leaves no stone unturned to assure that your specifications are held completely. In addition to custom rings, Reliance produces an extensive line of standard rings for most standard ring applications. Write for engineering specifications.

EATON

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High-and mighty-stacker!

Lift, move and stack your king-size loads with a massive Gerlinger lift truck that takes weather, grades and rough terrain in its stride! Transporting 5 . . . 10 . . . 20 ton payloads in one man operations means *king-size savings* as well.

You'll get all the instant power, roadability and load stability you need, in *Gerlinger* lift trucks—literally "made to measure" for your specific handling operations. Ask for Towmotor-Gerlinger Certified Job Studies—and new Specification Folder GSS. Write Towmotor Corporation, Cleveland 10, Ohio or Gerlinger Carrier Co., Dallas, Oregon.

TOWMOTOR ®
THE ONE-MAN-GANG

-GERLINGER* **LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS**

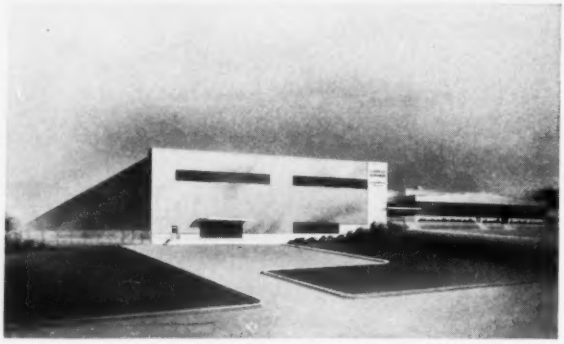
*Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

GOLD-CLAD STAINLESS TUBING CURBS CORROSION IN REACTOR

Photo pictures insertion of gold-clad stainless steel heat exchanger into gold-clad power reactor at AEC's Los Alamos Scientific Laboratory. Completely successful in recent operational tests, the unique reactor is designed to produce superheated steam in a single pass. This is the second experimental reactor using uranyl phosphate fuel—the first unit failed because of excessive corrosion in the heat exchanger. Gold-cladding now protects all structural parts in contact with the extremely corrosive solution.

Will clad metals solve *your* corrosion problems? Investigate the BISHOP line of clad metals. BISHOP was the first company to successfully produce gold-clad stainless tubing . . . coupon brings data. Use it.

NEW BISHOP TUBE MILL OPENS



Sketch shows new BISHOP facilities adjacent to the present tube mill in East Whiteland Township, west of Paoli, Penna.—completing the first stage in BISHOP'S long range expansion program. This two-story structure will contain over 165,000 square feet of floor space. BISHOP platinum mechanical manufacturing operations also move to the East Whiteland plant.

BISHOP NOW DRAWING .002" WALL TANTALUM TUBING

Tantalum tubing with paper-thin wall thicknesses is now being supplied by BISHOP on special order. Sizes range from .062 in. OD x .002 in. wall to 1.5 in. OD x .125 in. wall. Columbium (niobium) tubing down to .002 in. wall has been produced and is also available. Can tubing of these "exotic" metals be the answer to any of your design problems? Check with BISHOP . . . use the coupon.

J. BISHOP & CO.

platinum works

FOR HELPFUL DATA USE THIS HANDY COUPON

- ☐ Tubular Product's Bulletin No. 12
- ☐ Platinum Products Catalog No. 4
- ☐ Clad Metal Data
- ☐ Special Tubing Data

Check information you'd like and mail to
J. BISHOP & CO.,
30 King St., Malvern, Penna.

Name _____

Position _____

Company _____

Address _____

City _____ Zone _____ State _____

Tubular Products Division

30 KING STREET, MALVERN, PENNA.

NIagara 4-3100

THIS IS THE BISHOP LINE:

Products of all the Platinum Metals... Small diameter Stainless Steel, nickel and special alloy tubing

Kaiser Aluminum doubles capacity with new Bliss hydraulics

Unusual control system provides broad job shop work range in both hand and closed die forging ... This 8,000-ton Bliss Hydro-Dynamic* press, together with similar 3,000-ton and 5,000-ton presses, are the key units in the recently completed $5 million press department at Kaiser Aluminum & Chemical Corporation's Erie, Pa., plant. The presses have doubled Kaiser Aluminum's capacity to produce a broad range of aluminum forgings for commercial applications, as well as for aircraft and missile components.

In spite of their size, the presses have unusual flexibility: the multiple cylinder design of the two larger units and novel automatic control systems provide precise, stroke-after-stroke regularity of forging speed and pressure.

What's your press need? In everything from bench presses to giant hydraulics, you'll find the greatest reliability ... and the most advanced engineering ... in a Bliss.

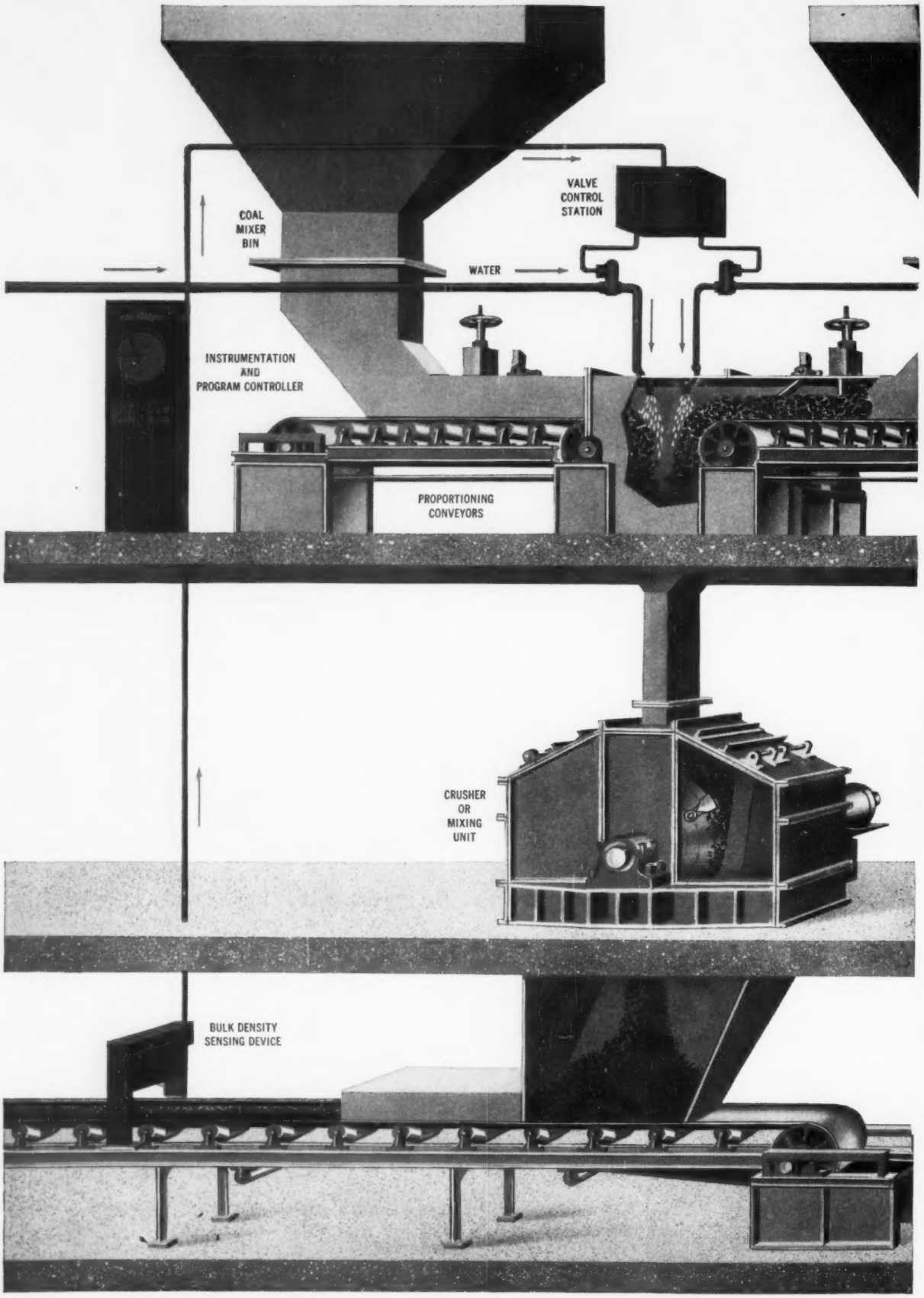
*Registered trademark E.W. Bliss Company

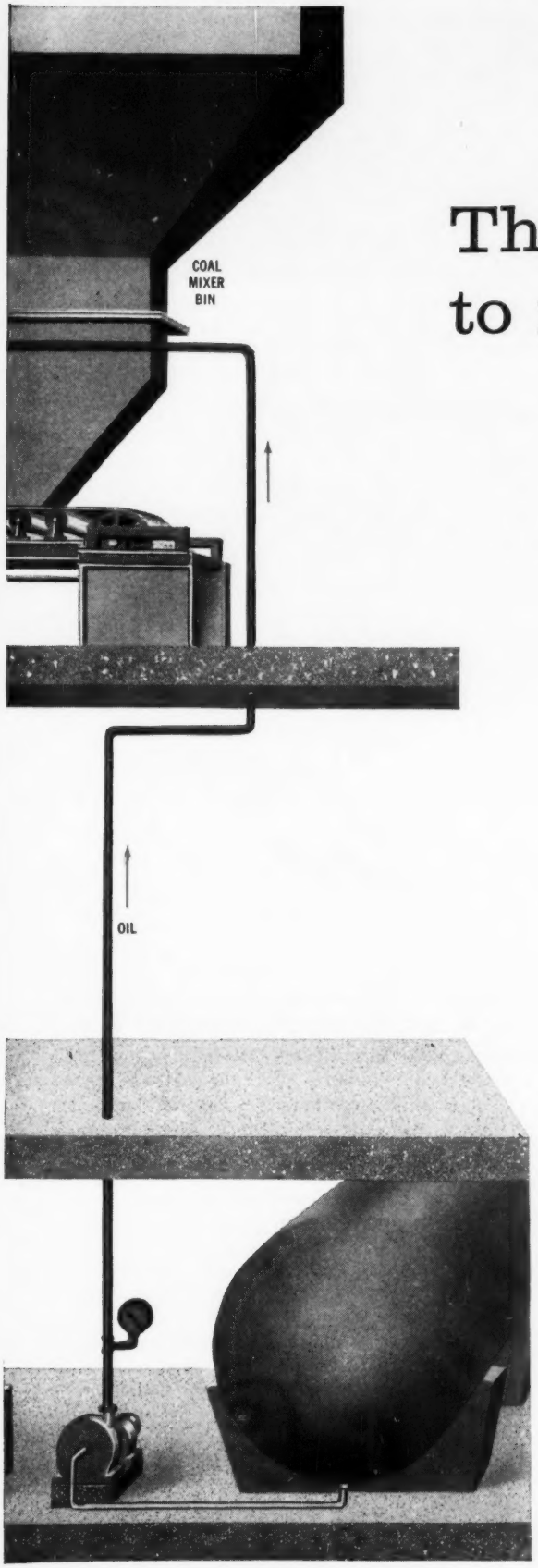
BLISS
SINCE 1857 ®

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.


VALVE
CONTROL
STATION
COAL
MIXER
BIN
WATER
INSTRUMENTATION
AND
PROGRAM CONTROLLER
PROPORTIONING
CONVEYORS
CRUSHER
OR
MIXING
UNIT
BULK DENSITY
SENSING DEVICE



The weigh to make coke better

Koppers automatic bulk density control of coking coal

Coke ovens operate most efficiently when the coal mix is kept at a uniform, optimum density. If bulk density is too high, oven walls may be damaged by the extreme pressure of expansion during the coking cycle. If the density is too low, coke production will be less than oven capacity.

For accurate control, the coal has to be weighed and then bolstered with oil to raise the density, or watered to lower it. The usual hand control can be a slow and costly operation, and just doesn't do the job. But Koppers has developed *automatic* bulk density control equipment. A sensing device measures bulk density as the coal conveyor moves past the mixing unit. The measurement is relayed to a control center which then regulates the addition of water or oil to the coal flow.

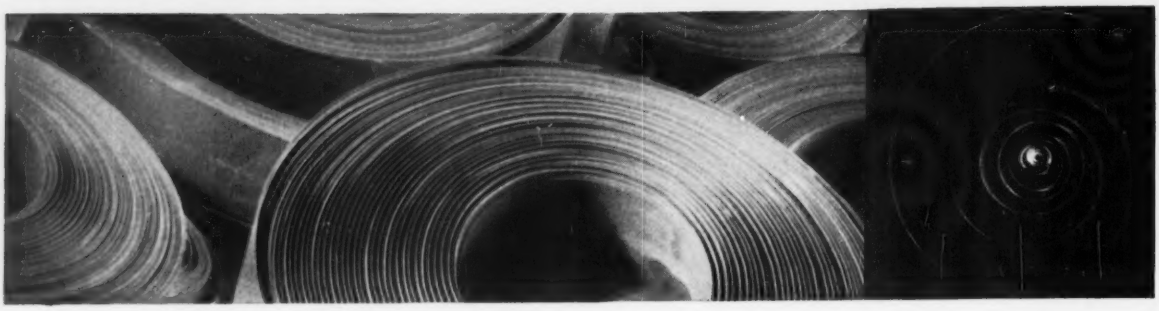
Bulk density control achieves consistent coke quality, and increases coke production.

Koppers Company has been assigned U. S. Patent Numbers 2,378,420; 2,510,158; 2,765,266; and 2,864,537 which cover equipment for bulk density control. If you would like to have more information about the Koppers control systems, or if you would like information regarding use of bulk density equipment under Koppers patents, please write to Koppers Company, Inc., Engineering and Construction Division, Koppers Building, Pittsburgh 19, Pennsylvania.

KOPPERS

KOPPERS

ENGINEERING AND CONSTRUCTION



How they're using

Wallace Barnes Cold-rolled Specialty Steels

1. *In Three Drawing Stations*

The part shown in illustration one was made from .59 – .74% carbon steel in three drawing stations. From .70 – .80% carbon, this piece should have four or five drawing stations. The piece could be made from .90 – 1.05% carbon, but would require seven drawing stations with fully annealed steel.

2. *Blanked on 45° Angle*

The stamping shown in the second illustration was made from .70 – .80% carbon spring steel. It was blanked and pierced on a 45° angle, with small holes pierced to prevent fracture in later forming and bending. It was then given severe secondary forming. The small tab shows "orange peel" and probable fracture would occur if the part were formed from .90 – 1.05% carbon.

3. *All Flanging One Operation*

Our third part is a gun stamping made from .70 – .80% carbon with a sharp bend with the grain in one stroke of the press. Higher carbon will fracture due to its less ductile qualities.

4. *Thirteen Steps Progressive*

The fastener shown in the fourth illustration was made from the .59 – .74% carbon steel, the only spring steel which would take the bends and draws to which it is subjected here. All the higher carbon steels were rejected because they failed under the cold-work necessary to produce the two small extrusions. It took seven reductions to bring these extrusions within tolerance. There were thirteen steps total in the progressive die.

These examples show how proper steel selection may save operations and insure satisfactory performance. Among the many sizes and types of Wallace Barnes cold-rolled specialty steels is the right one for your application. Send for "Physical Property Charts" giving tensile strength and forming properties of Wallace Barnes tempered steels.

Wallace Barnes Steel Division

Bristol, Connecticut

Associated Spring Corporation

5808

NEW 5"-10" BENDING ROLLS ...produce cylinders with work-saving ease and cost-cutting speed

Model 5-60 (5' x 60")

Model 10-120 (10' x 120")

NIAGARA

Sleek, massive and low-built, these modern machines form commercially true cylinders with utmost speed and operating ease.

Adjustments for thickness and curvature are made quickly. A three-roll gear train keeps gears continually in mesh. Curving starts easily. Work in the rolls can be stopped instantly, reversed rapidly, or jogged in short increments . . . *at the touch of a button.* No drifting! Operation is quiet: Silent worm gear drive runs in a sealed bath of oil. Fully formed cylinders are easily removed via an air operated drop end. Performance is vibration-free: No foundations or floor bolting necessary.

Built in 5, 6, 7, 8, 9 or 10 in. diameters, Niagara Bending Rolls handle materials up to 14 ft. long and ⅞ in. thick. For complete information, request Bulletin 77.

MAKE YOUR OWN COMPARISON

with these standard and special features

- **Silent, totally enclosed worm gear drive**
- **Rugged, all-welded steel construction**
- **Full length, emergency stop treadle**
- **Three-roll gear train speeds work, protects quality**
- **Air operated drop end for easy removal of cylinders**
- **Quick, lower pinch roll adjustment**
- **Rear roll power adjusted, with indicators to duplicate settings**
- **Pinch type rolls minimize flat spots**
- **Longitudinal grooves permit one-pass forming of small diameters**
- **Pushbutton controls, conveniently located at operator's station**
- **High torque main drive motor with magnetic brake and reversing control**
- **Centralized pressure lubrication**

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N.Y. • District Offices and Distributors in principal U.S. cities and major foreign countries

CAMBRIDGE METAL-MESH BELTS give you the low-cost, continuous production you need to beat competition in the '60's!

Metal products of all types move through sintering, brazing, annealing, quenching, washing or hardening operations faster—and without costly manual handling. Uniformity is high because heat, gases or liquids flow through the belt and around the product for thorough treatment.

Superior belt design and manufacturing techniques save on operating cost, too, by giving longer belt life, fewer repairs. Belts can be made heatproof, coldproof, corrosion resistant—in any mesh, weave, metal or alloy—with any side or surface attachments.

Call your Cambridge Field Engineer now. He'll be glad to discuss any aspect of Cambridge Belts—from manufacture to installation and service. Look in the Yellow Pages under "Belting, Mechanical". Or, write for FREE 130-PAGE REFERENCE MANUAL.

The Cambridge Wire Cloth Co.

Department J • Cambridge 9, Md.

Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

News! The best features of modern bearing design combined and refined in

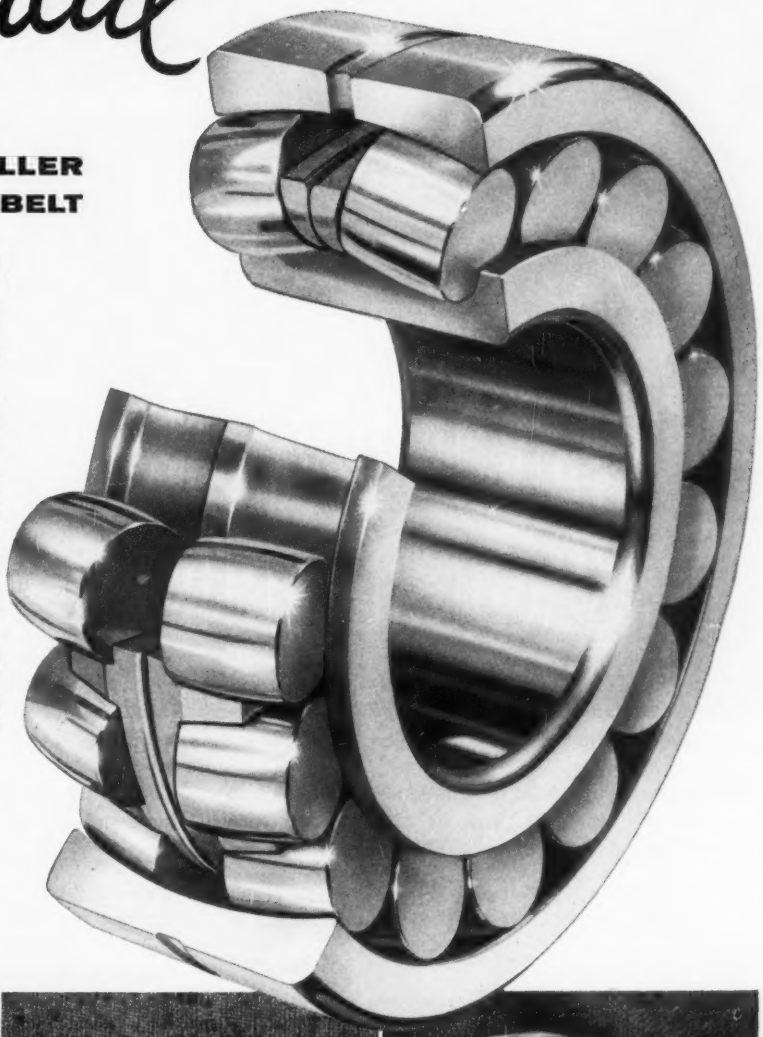
Spherical

SELF-ALIGNING ROLLER BEARINGS BY LINK-BELT

BIG, mirror-smooth convex rollers *plus* heavy, broad-shouldered inner race *plus* centrifugally-cast bronze, precision-machined retainers! Only from Link-Belt do you get ALL that is best in modern bearing design.

Individually, these elements represent major improvements on accepted design concepts. Collectively, they constitute the most efficient spherical roller bearings available . . . promise unequalled economies, whatever the application.

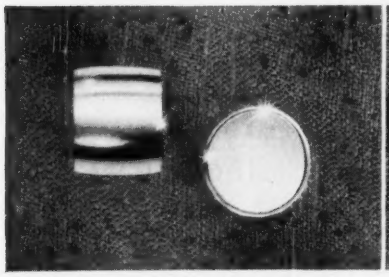
Your Link-Belt office or authorized stock-carrying distributor will gladly explain the many performance advantages evolved with this new design. And either can furnish full data on industry's most complete line of ball and roller bearings . . . pillow blocks and flanged, flanged-cartridge, cartridge and take-up blocks.



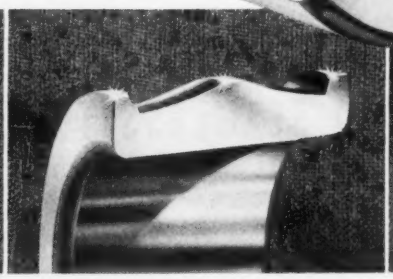
LINK-BELT

MANUFACTURERS OF SELF-ALIGNING BALL AND ROLLER BEARINGS

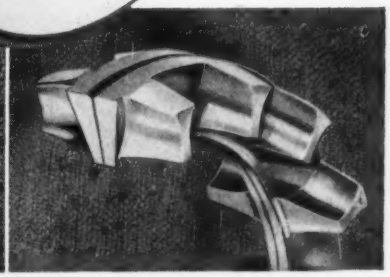
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. Plants, Sales Offices and Distributors in All Principal Cities. 14,819



BIG, HIGHEST-CAPACITY ROLLERS. Each bearing has a maximum number of rollers—as large as possible, yet all components are in optimum balance.



HIGH, HEAVY INNER RACE FLANGES present convenient hold for assembly and removal of bearing without cutting away shaft, avoid any need to skimp on shaft shoulders.



PRECISION-MACHINED, CENTRIFUGALLY-CAST BRONZE RETAINERS have many times more support and ability to withstand high stress. They are not stampings. Design assures maximum bearing efficiency.

Aircraft Components Manufacturer Specifies

OSTUCO *Forged Tubing*

FOR LOWER MACHINING COSTS

Forging tube end in Shelby mill. In addition, Ohio Seamless can supply tubing flared, swaged, expanded, upset, flanged, shaped, etc.

"Our machining time on this landing gear part in SAE 4140 plummeted from *400 to 180 minutes* when we changed from forgings to Ostuco Forged Tubing.

"In addition to getting *over 80% more parts per workshift*, we like the free-machining qualities of Ostuco tubing that give us extra savings in set-up time and tool grinding costs . . . "

These actual figures, from an eastern manufacturer, indicate the machining economies Ostuco Forged Tubing can effect in your product. The starting point is to call your nearest Ohio Seamless office, listed in the Yellow Pages, or the plant at *Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.*

AA-9880

OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Miami, Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita. CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

Your new plant or expansion idea

Raw materials available?

Right process chosen?

Location correct?

Capacity adequate?

Economically sound?

Readily financed?

Kaiser Engineers designs and builds major facilities for the Steel industry, and is U. S. licensor for the proven L-D Process of oxygen steel making.

Among KE's most valued services are sound, searching economic analyses, feasibility studies and site evaluations. In a word—*Pre-Engineering*—impartial, outside analysis which helps you decide whether to proceed with, defer, or modify the project.

Kaiser Engineers offers you cost-saving, time-saving, one-company service from concept through start-up.

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Division of Henry J. Kaiser Company
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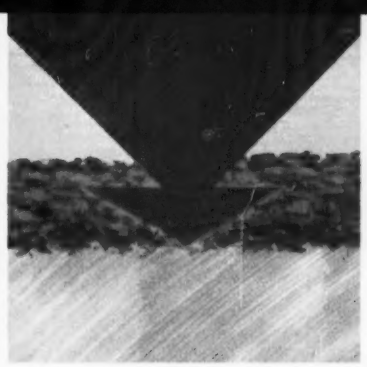
• KE projects include work in Argentina, Australia, Brazil, Formosa, Japan, New Zealand, as well as Canada and the United States. Assignments range from preliminary planning to plant construction.

5459-9

You
the
RUST-OLEUM®
RUST PREVENTIVE
STOPS
RUST!®
BEAUTIFIES AS IT

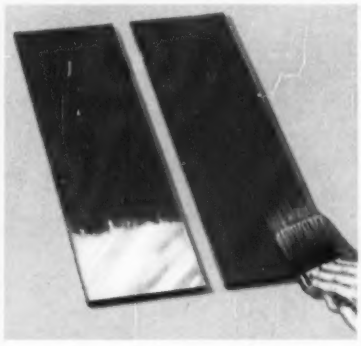
take brush!

Apply Rust-Oleum 769 Damp-Proof Red Primer directly over sound rusted surfaces. Saves costly surface preparations—lasts and lasts.



The **specially-processed** fish oil vehicle in the primer penetrates rust to bare metal—as proved in radioactive tracing studies.

Rust-Oleum, in its many forms, resists rain, fumes, heat, moisture, sun, and general weathering to stand up over the years.



Up to 30% more coverage with Rust-Oleum, depending upon the condition and porosity of the surface. Another Rust-Oleum difference.

See the many Rust-Oleum DIFFERENCES yourself!

Rust-Oleum primers and finish coatings are easily applied by spray. Flows smoothly . . . may be used in conventional, hot spray, or high pressure air-less spray.

A few easy strokes of the brush proves more than a thousand words . . . see how smoothly Rust-Oleum flows on . . . no pull, no drag . . . and it dries free of brushmarks. See, too, how much more coverage Rust-Oleum gives you . . . up to 30% more area depending upon the condition and porosity of the surface.

If your metal surfaces are *rusty* – simply brush or spray Rust-Oleum 769 Damp-Proof Red Primer right over the sound rusted metal after scraping and wirebrushing to remove rust scale and loose rust. The *specially-processed fish oil vehicle* in the primer penetrates rust to bare metal—driving out air and moisture. Easy as that to Stop Rust—and save time, money, and metal.

For *lasting beauty* – follow up with a Rust-Oleum finish coating in the color of your choice – from grays, greens, blacks, and aluminums to yellows, blues, whites, or browns – or from the many popular pastel shades.

That is the Rust-Oleum *System* of primer and finish coat for maximum over-the-years protection. A system that is measured by the money you save. Specify Rust-Oleum for maintenance, new construction, and re-modeling. Your Rust-Oleum Industrial Distributor maintains complete stocks for prompt delivery . . . he will be happy to consult with you on your coating problems.

What is your coating problem? What **color** do you need? Get lasting beauty in the color of your choice. Mail coupon for color charts.

SEE OUR CATALOG IN SWEET'S
OR WRITE FOR COPY

A matter of excellence.
Distinctive as your own fingerprint.

SEND FOR FREE TEST SAMPLE! ATTACH TO YOUR LETTERHEAD!

Rust-Oleum Corporation
2981 Oakton Street, Evanston, Illinois

Please send me the following at no cost or obligation:

- ☐ Free test sample of Rust-Oleum 769 Damp-Proof Red Primer for rusted metal surfaces.
- ☐ Complete literature with applications and color charts.
- ☐ Information on matching special colors.
- ☐ Thirty-page report on Rust-Oleum fish oil penetration.

Now you can use

NIALK® TRICHLOR FOR BOTH FLUSHING AND VAPOR DEGREASING

Use just one grade of trichlor to flush missile and rocket parts and for vapor degreasing

The *metal degreasing grade* of Nialk trichlorethylene meets government and industry specifications for flushing missile and rocket components.

Its residue is a low 0.0005%. It also meets standard impact sensitivity requirements.

Cut your inventory The time and money savings of this new development are obvious. In just one area —your inventory—you can make substantial savings.

Eliminate mistakes There's no chance of picking the wrong drum now that you need only one grade of trichlor for both flushing and vapor degreasing.

No disposal problems Take the Nialk trichlor you use for flushing and in most cases you can use it in your vapor degreasing operation without distilling.

Data sheet For more information on this standard grade of Nialk trichlor, write for data sheet No. 814.

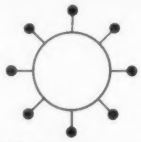
Remember—*only Nialk trichlor has* **psp.**

DOES YOUR SOLVENT SOUR?

1. Trichlor is protected by stabilizer against heat, air, light, moisture, acids, and active metals.

2. Ordinary stabilizers wear out during use, making it necessary to titrate and add fresh stabilizer.

3. A sour solvent can even stain metals instead of cleaning them; affects bath operation, too.



Nialk has **psp . . . permanent staying power.** Always gives you full protection. Never goes sour.

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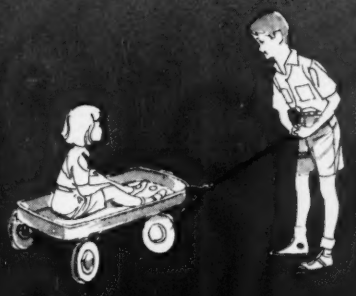
VERSATILITY

in customer service

helps cut production costs



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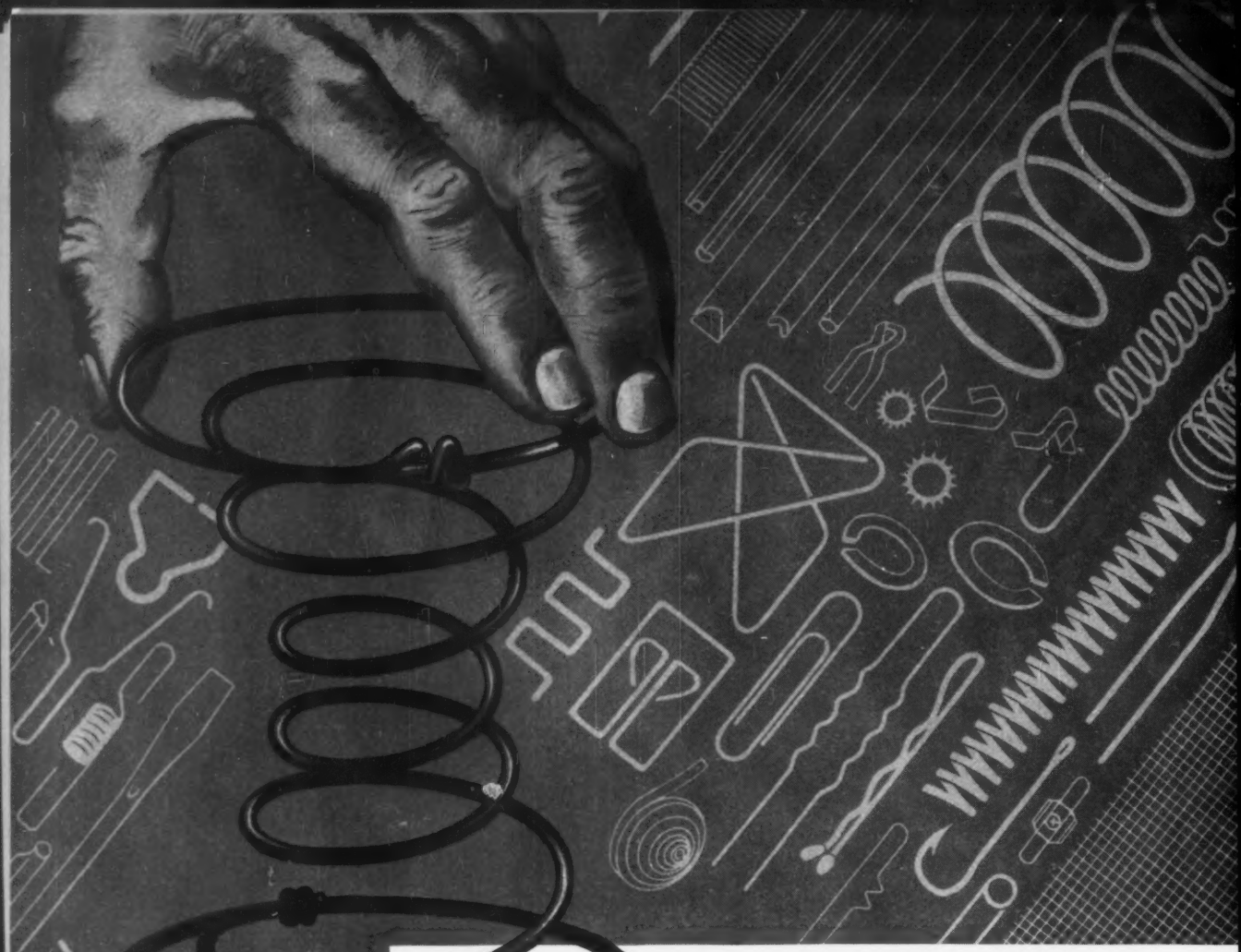

LET'S TALK WIRE!

This spring is typical of hundreds of types and sizes of springs made from PAGE wire—and springs are just one of the many end products for which PAGE manufacturers wire is a logical choice.

Regardless of your use of wire, you can count on PAGE uniformity. Whether you make hairpins or lock washers, PAGE wire will give you the tensile strength, ductility, finish, tolerance and other properties you require.

PAGE facilities are designed to produce a wide range of high quality manufacturers wire items—including special shapes. Where requirements are exacting, you will find PAGE wire unexcelled.

Since 1902, we have pioneered many "firsts" in the wire industry. The latest of these is corrosion-resistant ACCO Aluminized Wire—commercially pure aluminum bonded to a steel core.

Why not put PAGE experience and knowledge to work for you to improve your product and lower your costs.

Let's get together and talk wire!

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PAGE *-the source for answers to wire problems*

GOOD NEWS FOR GRINDING MILL ROLLS...HOT or COLD!

NEW! **Norton wheels . . . precisely duplicated . . . produce the rolls you want . . . every time**

To meet rolling mills' requirements for repeatedly good performance in roll grinding, Norton now brings you these two outstanding specialities:

NEW!

B12 Resinoid Wheels for hot mill rolls.

E6 Shellac Wheels for cold mill rolls.

The new B12 and E6 wheels are made under process controls that assure precise duplication — from wheel to wheel and from lot to lot. In both wheel types that means duplicating the same outstanding features and performance — including the precise balance and uniform structure that result in fast, smooth grinding and long wheel life.

These advantages have been reported from mills throughout the country. Extensive job-testing gave the new Norton wheels first place in economy, in production-per-wheel and in producing the desired chatter-free finishes. Both new wheels maintained top grinding efficiency from full size to discard.

Let us show you how these "Touch of Gold" benefits can bring you trouble-free grinding and cut your production costs by arranging test runs of B12 or E6 wheels in your mill. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

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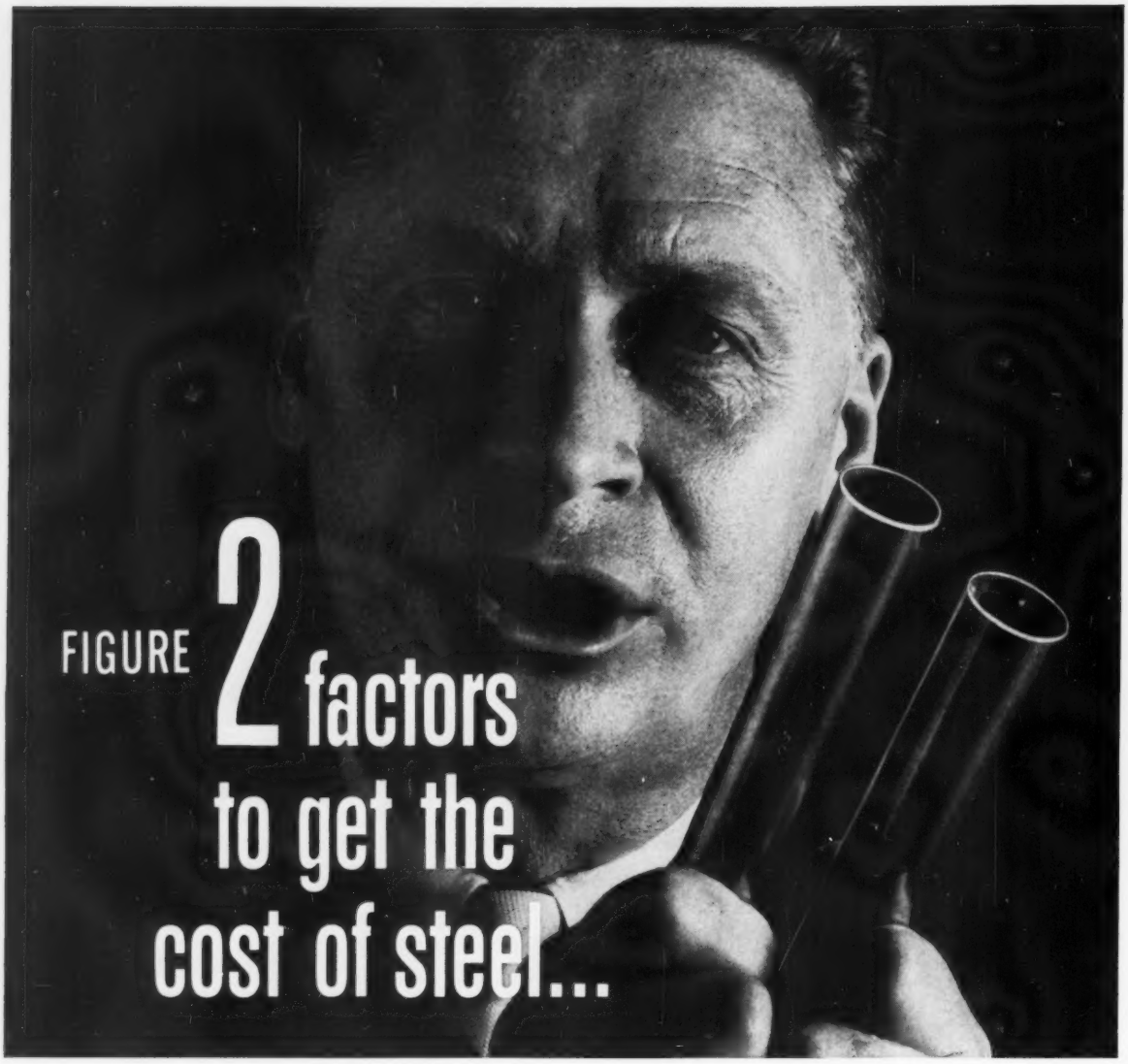


COST OF POSSESSION is part of your final cost!

When you keep a miscellaneous inventory of steel, you inflate your costs and tie up capital *uselessly*.

You can avoid this. Many smart cost-minded steel users are buying all or a major part of their steel needs from Steel Service Centers. They get stock cut-to-size and delivered promptly.

Couldn't this save you money too, by reducing the costs of storage, space, handling, cutting, waste and obsolescence?

Next time you order steel, compare price plus cost of possession with what Service Center steel would cost you. For more information, get the booklet, *What's Your Real Cost of Possession for Steel?* from your nearby Steel Service Center. Or write American Steel Warehouse Association, Inc., 540-G Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL_____

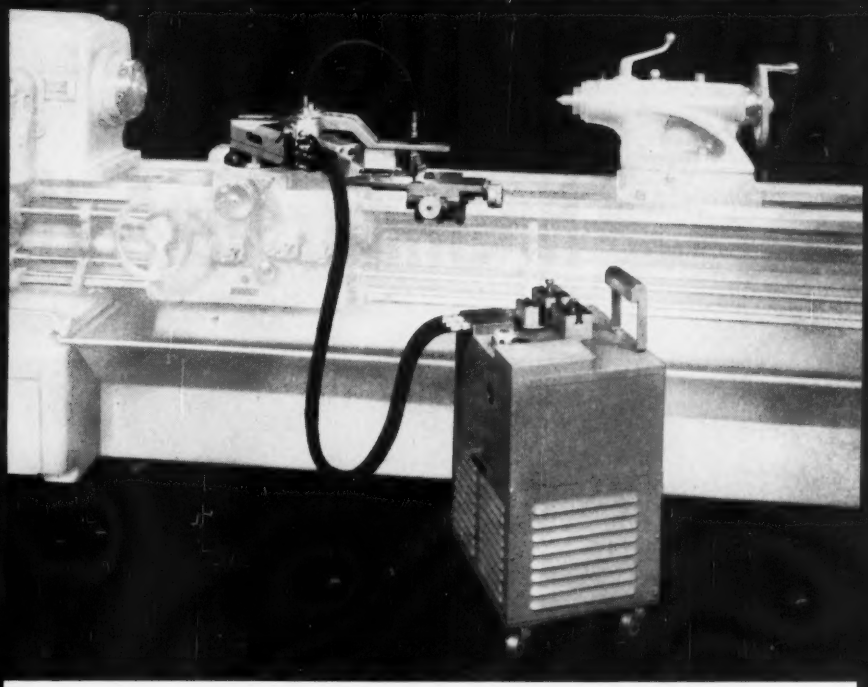
AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

...YOUR STEEL SERVICE CENTER

Monarch's Building Higher Production for Tomorrow's Boom

THE LATHE ON YOUR FLOOR WILL PRODUCE MUCH MORE



3..The New Air-Tracer Pak... Portable Unit for Standard Monarchs in Your Plant

Here's a real turning technique breakthrough! The Air-Tracer Pak is just what the name implies—a portable, easily applied device for temporarily or permanently adding to many standard Monarchs in your shop *all the advantages of Air-Gage Tracer production.*

And what are those advantages? In a nutshell, this, the most accurate duplicating method in general use, always outproduces manual operation up to 8 to 10 times. It sizes automatically and, using only a single running tool, is ideal for *small lot repetitive work* without the need for expensive form tools or multiple tool setups.

Its accuracy of ± .001" on most work often cuts in half the stock left for grinding; sometimes eliminates grinding and polishing. It allows complete setup change in as little as 15 to 20 minutes and tool change in 1 minute. It is also the simplest, most trouble-free of all lathe duplicating units.

The photos show how the tracer slide assembly quickly replaces the regular compound rest on the cross slide. Note the template support and micrometer dials—the portable, completely self-contained power unit at the front of machine with air supply and electrical connections in the base.

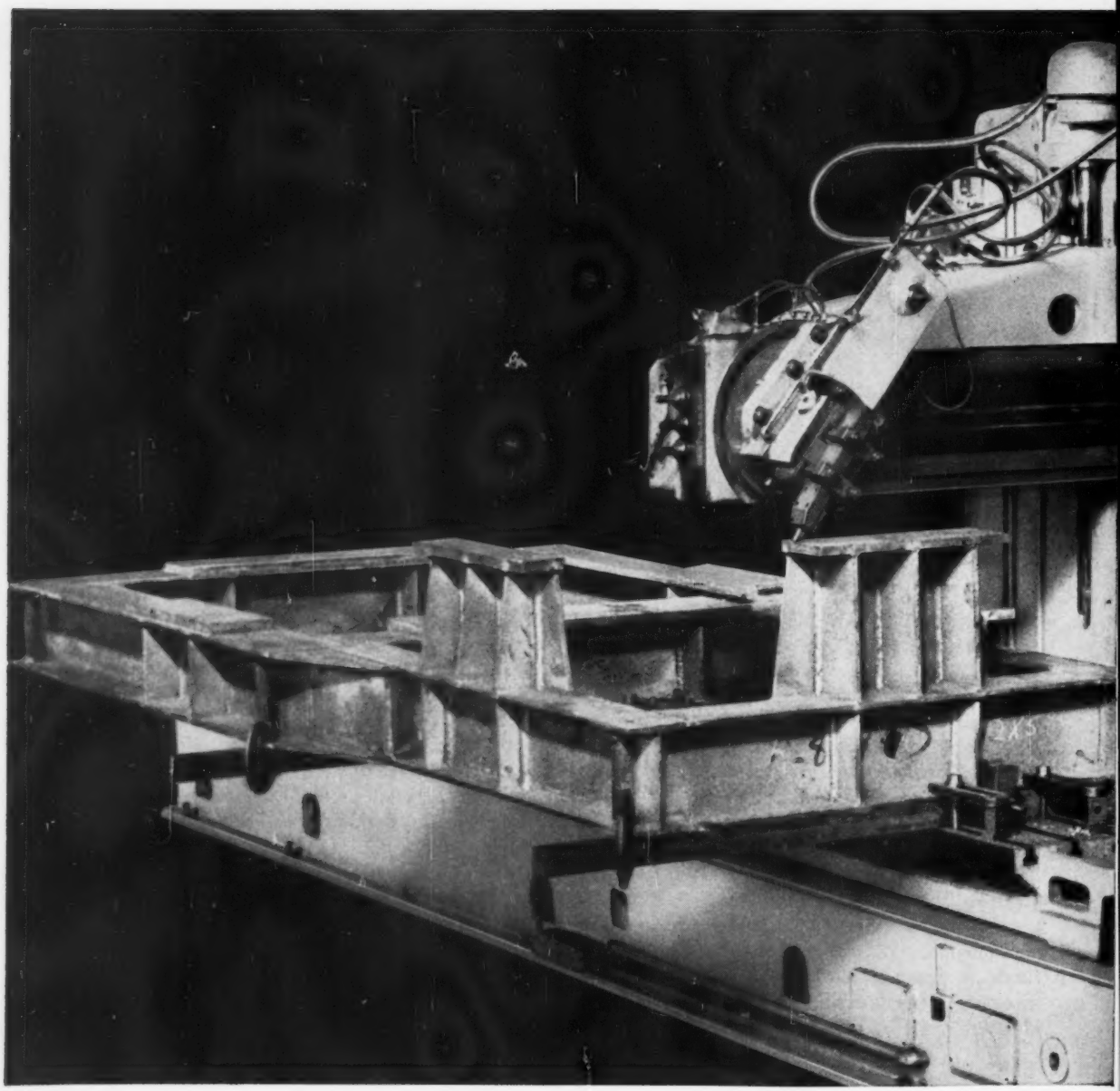
Presto! it's on. And presto! it's off. Yet it's an adaptation of the time-tested swiveling Air-Gage Tracer with the versatility to handle the more complex turning, boring and facing jobs.

This is news! Write—or phone today—for the full story... The Monarch Machine Tool Company, Sidney, Ohio.

Monarch
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

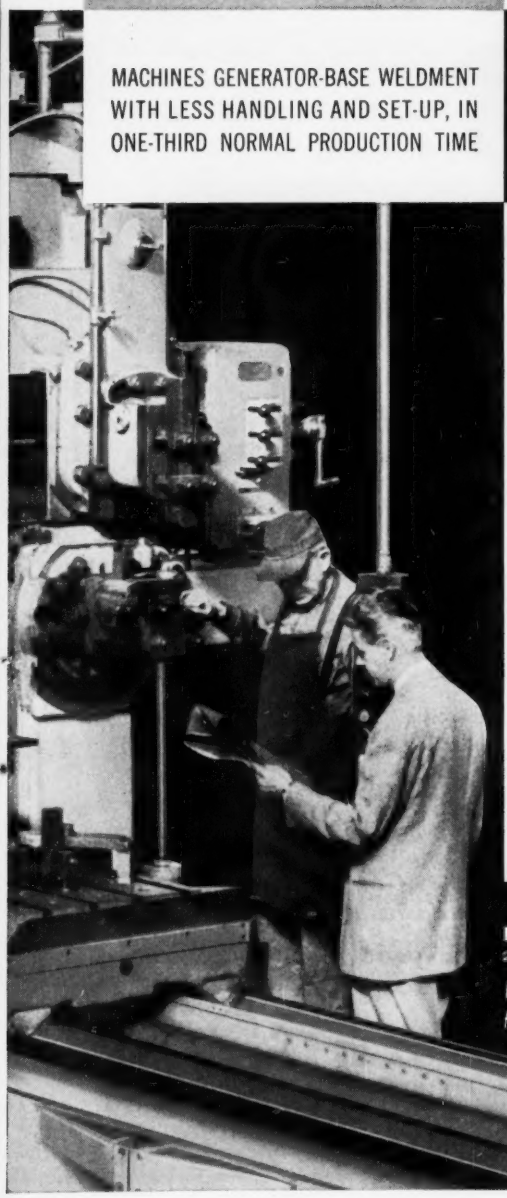
Nothing does the job like a...



ROCKFORD

... HYDRAULIC PLANER

MACHINES GENERATOR-BASE WELDMENT WITH LESS HANDLING AND SET-UP, IN ONE-THIRD NORMAL PRODUCTION TIME



Machining data:

Dimensions Weldment ..... 8'7" wide
.....15'3" long

Weight Workpiece .....5400 lbs.

Operation:
Planing top-side pads, highest pad 30½" from base of work.

Set-Up Time .....1st set-up, 1¼ hrs.,
.....2nd set-up, 1½ hrs.,
includes surface indication for continuation of cut.

Machining Time .....17¾ hrs.

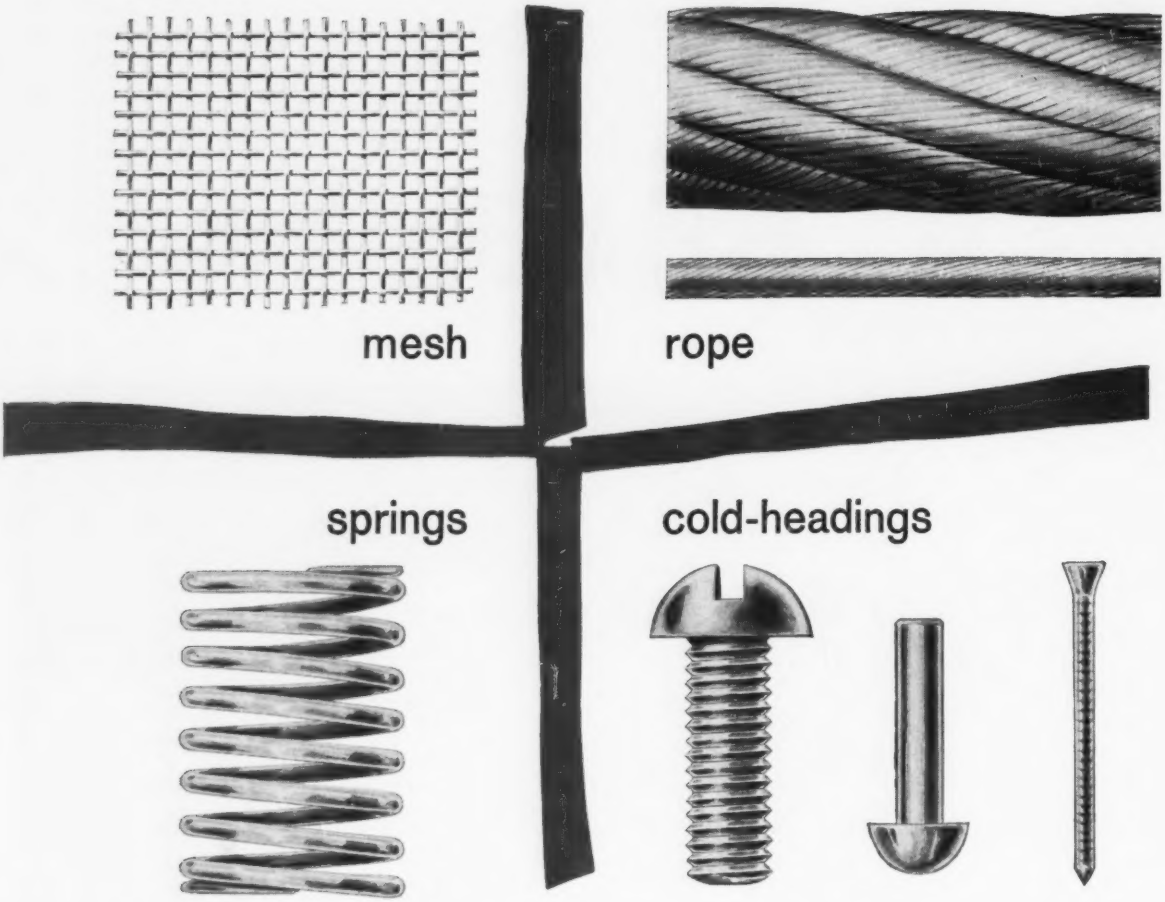
Nothing performs like hydraulic power:

- Infinitely adjustable feeds and speeds;
- Smooth, uniform cutting pressures for finer finish;
- Maximum metal removal per H.P. expended;
- Low Costs for machining, cutting tools and maintenance.

ROCKFORD MACHINE TOOL CO.
2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

Pioneers In The Use of Hydraulic Power for Reciprocating Machine Tools

whatever you make in stainless steel wire



let Allegheny quality help cut production costs

You start off with cold-drawn wire of almost every standard grade, tempered to provide many correlations of hardness and tensile strength to fit a wide variety of stainless steel wire products.

You go from there to Allegheny quality—absolute uniformity in every order. Your specifications are faithfully followed, order after order, and that adds up to savings in production costs.

If you make springs, you get uniform tensile strength in every batch . . . and with rope wire.

In weaving wire you get the same deadsoft temper, uniform properties for perfect weaving without ridges.

In cold-headed wire you get absolute uniformity that ties in with automation production processes.

Whatever you make in stainless wire, Allegheny Ludlum offers you adequate stocks of all standard grades for fast shipment. Special stainless steel wire on order.

A-L's technical staff will be glad to help you with problems of selection and fabrication, or offer technical assistance to help you cut shop costs.

Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-21.

Write for your copy of Allegheny Stainless Wire, Illustrated 20-page booklet, which fully describes analyses, physical properties, corrosion resistance and principal applications of stainless wire.

7860

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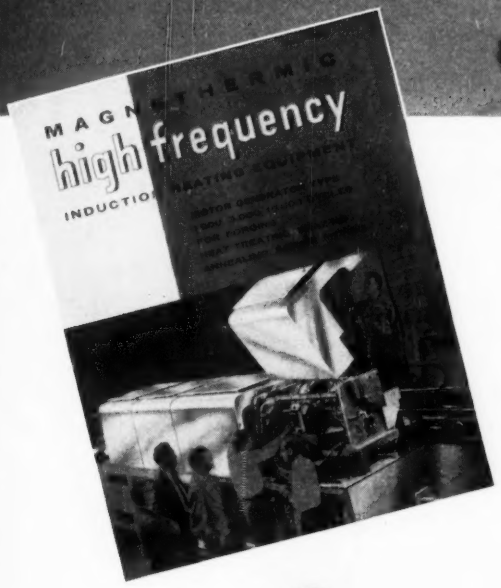
Export distribution: AIRCO INTERNATIONAL

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT



"I know Automatic Induction Heat Treating will cut my costs, *but WHO is the REAL AUTHORITY on the subject?*"

As the only fully integrated company for induction heating, Ajax Magnethermic can give unbiased recommendations on the best method of heating and the highest quality material and workmanship — all at competitive prices.

This company devotes all facilities and energies exclusively to induction heating... and has for many years. We know the heating and specifically the induction heating business.

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Induction Heating is our **ONLY** *Business*

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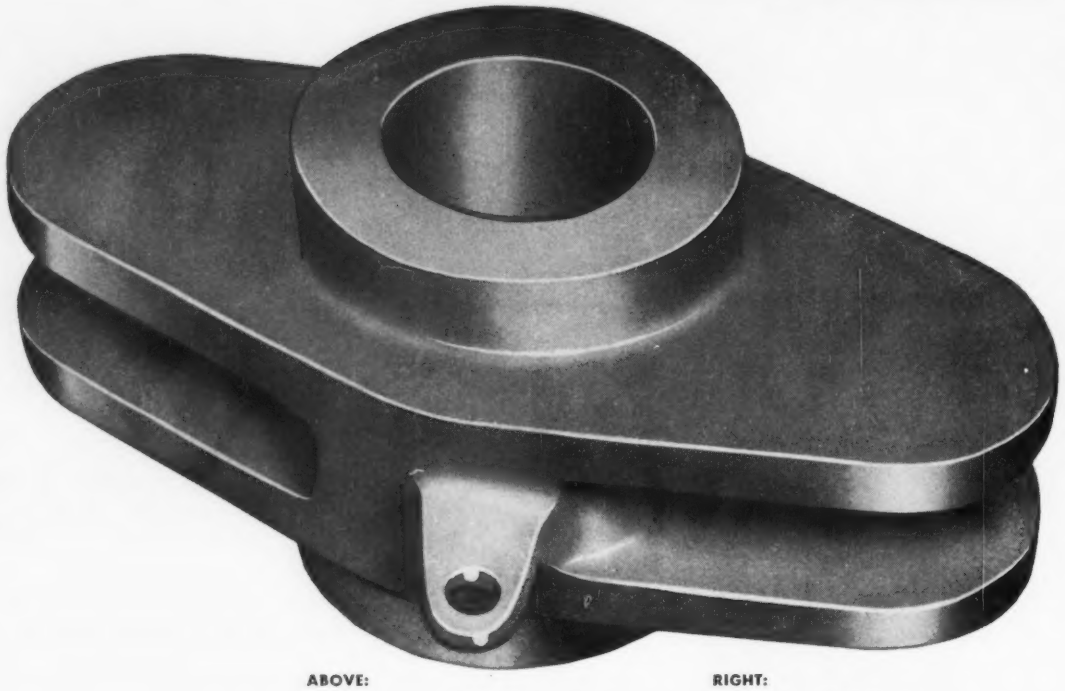
BEFORE YOU SAY . . .

"IT CAN'T BE CAST"



ABOVE:

Automatic Winch brake pawl carrier.

Previous cast weldment required costly machining. ESCO Shellcasting eliminated major machining and effected considerable savings.

RIGHT:

Transmission Shifter Fork.

As formerly cast the fork tip pads posed difficult alignment problems during machining. ESCO Shellcast made possible the casting of the fork tip pads to size and in alignment, eliminated machining, reduced the unit price.

CALL AN ESCO ENGINEER

ESCO alloy steel castings can make your designing *easier.* You get the part you want, in the alloy you need and in the shape that saves you the most fabricating, machining and finishing time.

PLUS METALLURGICAL ENGINEERING AND RESEARCH

ESCO maintains one of the largest and best equipped metallurgical staffs of any alloy steel foundry —

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An integrated service at all levels; in the field, at the drawing board and in the foundry —

PLUS FOUNDRY FACILITIES AND CASTING EXPERIENCE

A casting service that covers the complete range of alloy steel casting methods of all applications —

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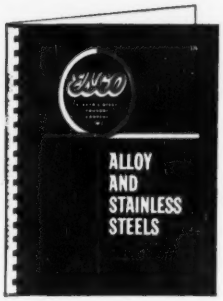
ESCO laboratory technicians are qualified and equipped to perform all types of inspections and testing to the most rigid specifications.



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Call an ESCO Engineer—let him show you how ESCO Alloy Steel Castings make your designing easier.

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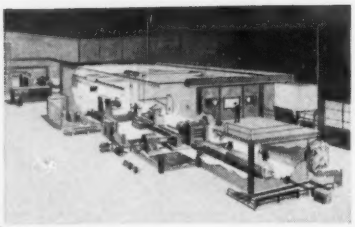
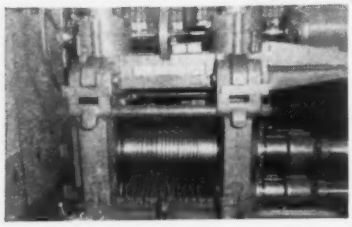
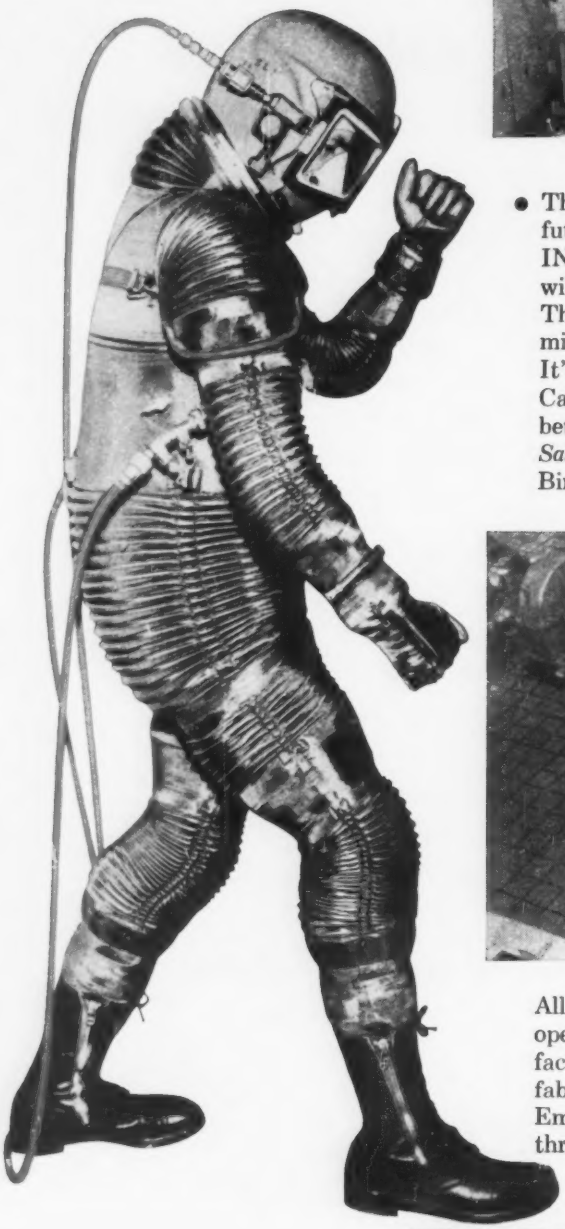
BIRDSBORO *helps close the metalworking gap between* ***today*** *and the* ***future***



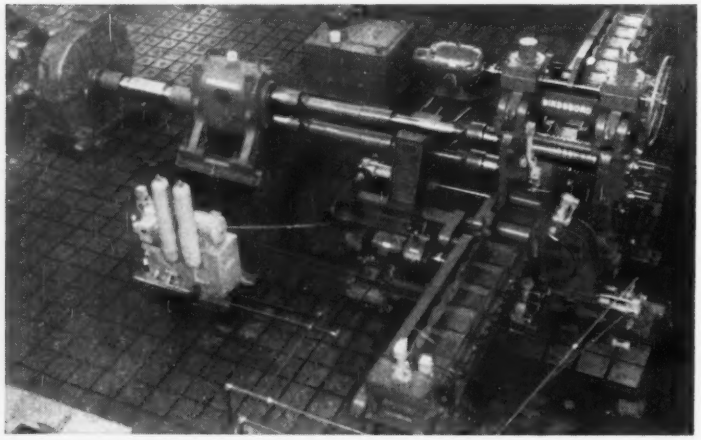


▲ Universal-Cyclops Steel Corporation's IN-FAB facility will fabricate refractory and reactive metals in an inert atmosphere at 3500° to 4000°.

◀ This new BIRDSBORO combination 16″-14″ two-high reversing mill will roll refractory metal flats, squares and rounds.



- The "space-suit" metalworker is not a man of the distant future . . . he starts work in 1959, in the Universal-Cyclops IN-FAB rolling mill facility. Refractory and reactive metals will be produced in an inert atmosphere at 3500° to 4000°. The BIRDSBORO combination 16″-14″ two-high reversing mill used in this facility will roll flats, squares and rounds. It's another "First", a word often associated with Birdsboro. Call Birdsboro in on your next project. There may be a better way to bring the future closer in your operation. *Sales Department, Engineering Department and Mfg. Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.



All rolling will be done automatically and controlled by an operator in an outside remote pulpit. The air inside the facility is replaced by argon gas so Universal-Cyclops can fabricate the metals at their best working temperatures. Employees will work in gas-tight suits, entering the plant through an air lock.

MM-75-59

BIRDSBORO

STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

MATERIALS & FABRICATION PREVIEW
of the SOARING 60's
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Here is an atmosphere steeped in discovery of the future — a preview of the kind of metalworking magic and technical wizardry that will propel America into the soaring 60's. Inspiring exhibits and thought-provoking technical sessions will draw 50,000 men of metalworking into a dynamic conclave of progress-producing activity.
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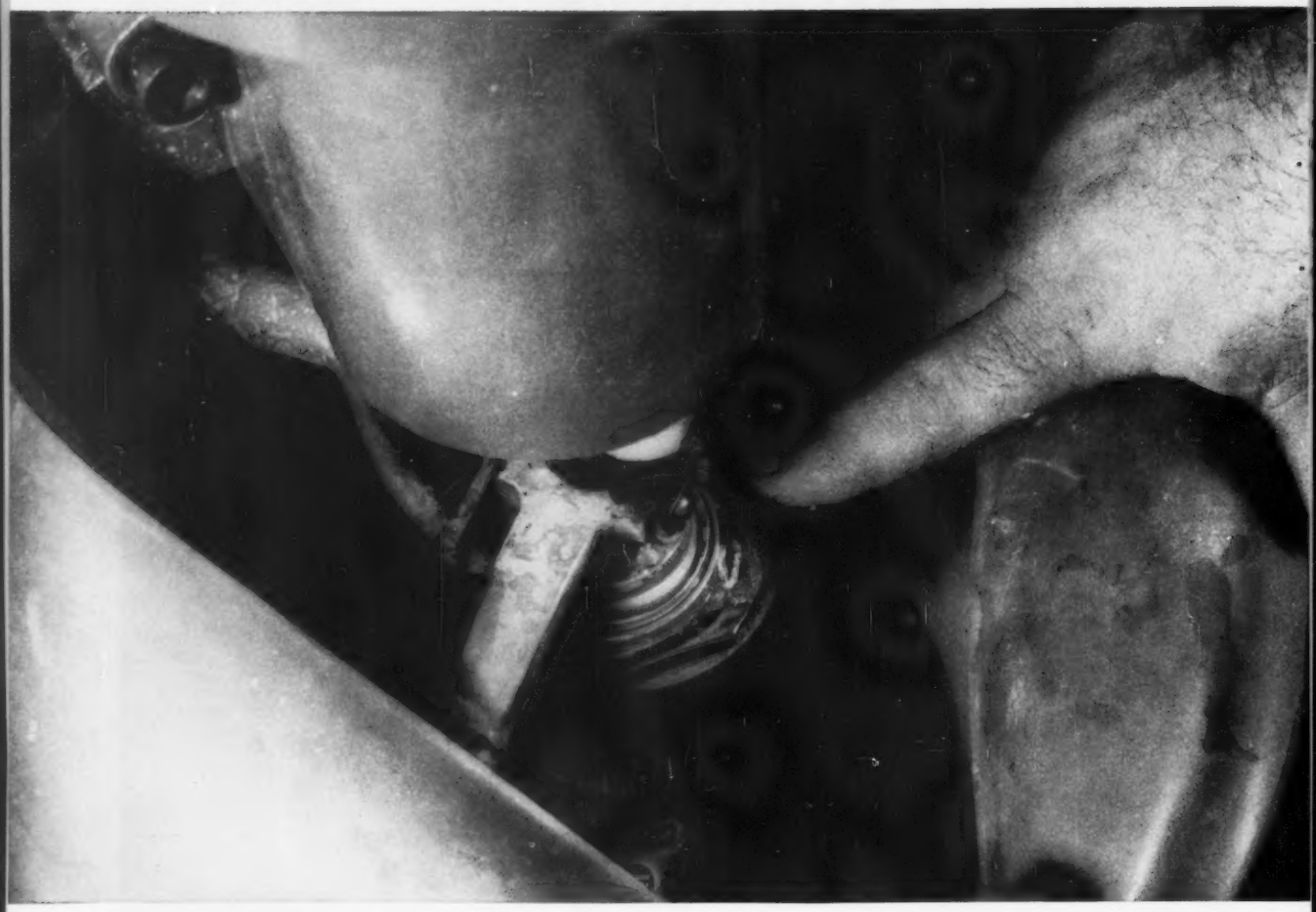
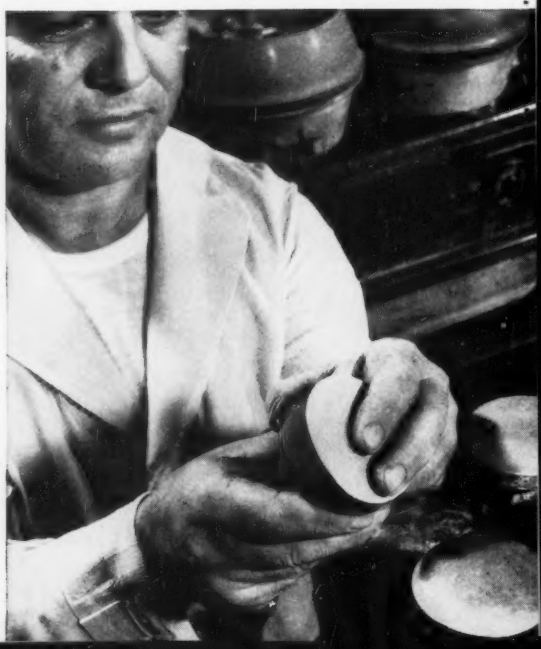
Cooperating Activities: The Metallurgical Society of AIME; Society for Non-destructive Testing, Inc. Associations presenting technical sessions in cooperation with ASM: Metal Powder Industries Federation; Metal Treating Institute; Ultrasonic Manufacturers' Association; Special Libraries Association—Metals Division; American Society for Testing Materials—Committee B-9; and the extensive programs of the American Society for Metals with the William Park Woodside Memorial Sessions, and ASM Metallurgical Seminar.

How NS solved another special steel problem



LENS GRINDING—the intermediate grinding stage, called "fining" is done on this type machine. The square piece of optical glass, with corners trimmed away, is mounted on an overhead chuck which bears down on the fining tool. The fining tool surface is covered with a round piece of wire cloth (man's finger is touching edge of wire cloth) which carries the emulsified emery abrasive used in grinding the lens.



WIRE CLOTH disk is laid over tool surface and pressed down. Pressure-sensitive backing holds wire cloth to tool surface during grinding operation.

NS-REYNOLDS WIRE CLOTH CUTS ERRORS FOR LENS MANUFACTURER

A leading manufacturer of ophthalmic and corrective eye glass lenses has eliminated tool wear, reduced lens grinding error and cut production time with a new integrated surfacing system for grinding tools, utilizing National-Standard Reynolds wire cloth as an abrasive carrier on the tool surface.

NS SOLVES A PROBLEM—Before the addition of the wire cloth tool facing, it was necessary to regrind the lens fining tools after every 3 or 4 lenses—a time consuming, costly procedure. The lens manufacturer came to the Reynolds Wire Division of National-Standard for help in finding a wire cloth with the high-degree of uniformity necessary to serve as a facing for the grinding tools. Reynolds Wire engineers recommended 0.007-inch, electrogalvanized steel wire woven to 30x30 mesh. Wire diameter was held to within a 0.00015-inch tolerance.

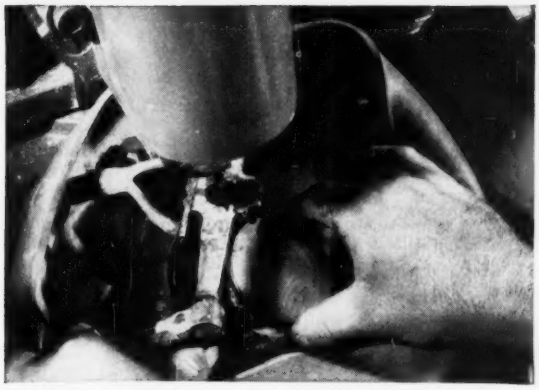
Under testing by the lens manufacturer, it was found that the wire cloth's uniformity allowed precision in grinding that virtually eliminated re-working. Grinding tools no longer needed re-truing, human error in finishing was eliminated, and the wire cloth held the grinding abrasive uniformly across the tool face for greater accuracy.

EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire is available to you from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

Manufacturer of Specialty Wire for Rubber Products

NATIONAL STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY**, Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL**, Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE**, Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS**, Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



GRINDING TOOL with wire cloth layer is inserted into bottom chuck of fining machine. Chuck rotates the tool for about 8 minutes during fining operation.

LENSES go through fining operation in one of four machines shown in the foreground before being polished in machines at the rear. The addition of wire cloth has also cut the fining operation time.

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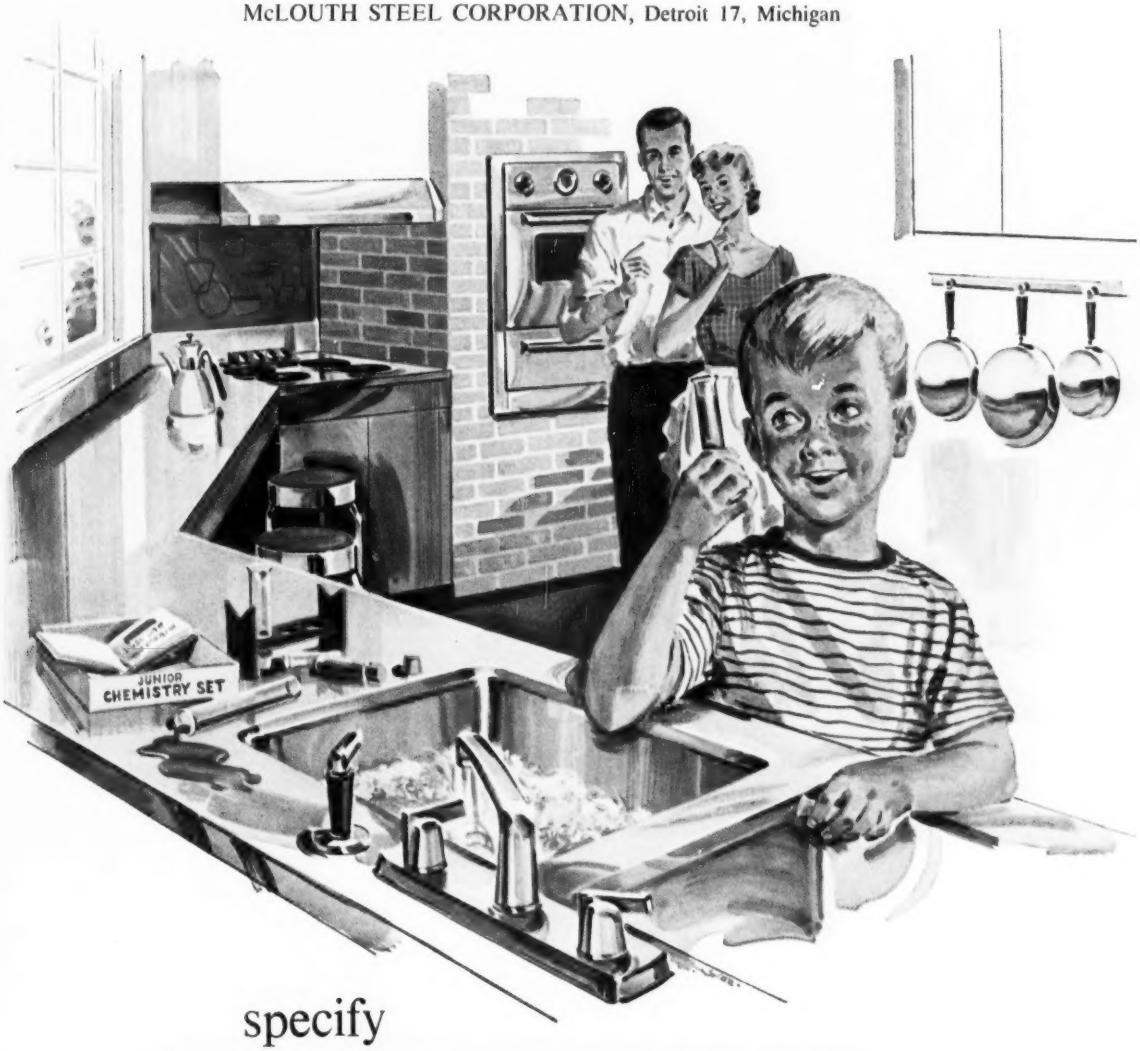

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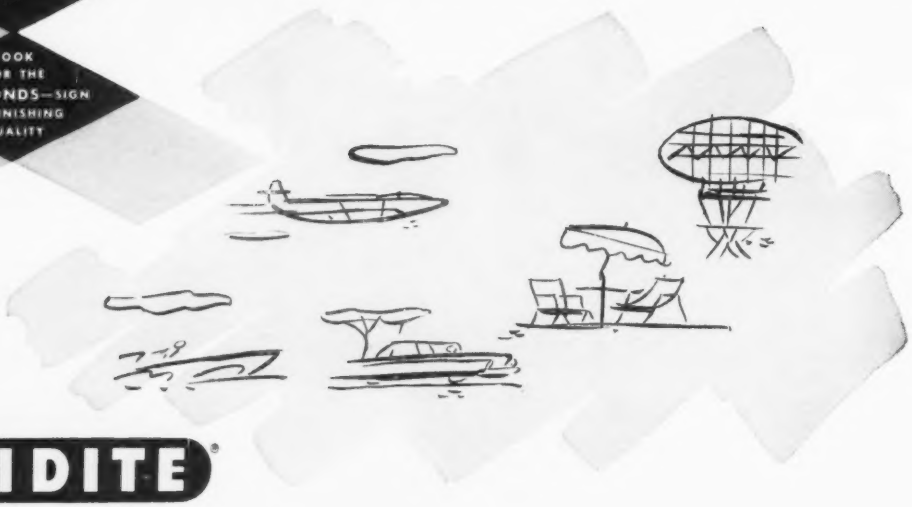

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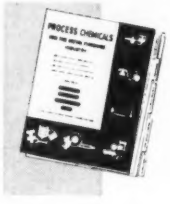

If you are using chromate conversion coatings to finish zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze — consider the above benefits of Iridite. For complete information, contact your Allied Field Engineer. He's listed under "Plating Supplies" in the yellow pages. Or, write for FREE TECHNICAL DATA FILE.

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If you use high-carbon wire in sizes from .060" diam. to .030" diam., it will pay you to investigate Roebling's Reel-less Core Packaging System. This method offers you substantial savings in several ways—to say nothing of the quality wire that Roebling always delivers in any kind of package.

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Empty reels are not accumulated because there are no reels to store, send back, bookkeep, get credit on, or pay shipping charges on (either way). Just unwrap the wire, set it up the way you see here, and there you are. Where a limited number of reel-less core packages are used, or where wire is flipped from reels mounted in a horizontal position, the tilt table is not necessary.

This method is typical, indeed, of Roebling's efforts to make quality easier to handle and to banish the problems that cost you time, money and sharp pains across the brow.

Full details of wire without reels will be immediately forthcoming when you write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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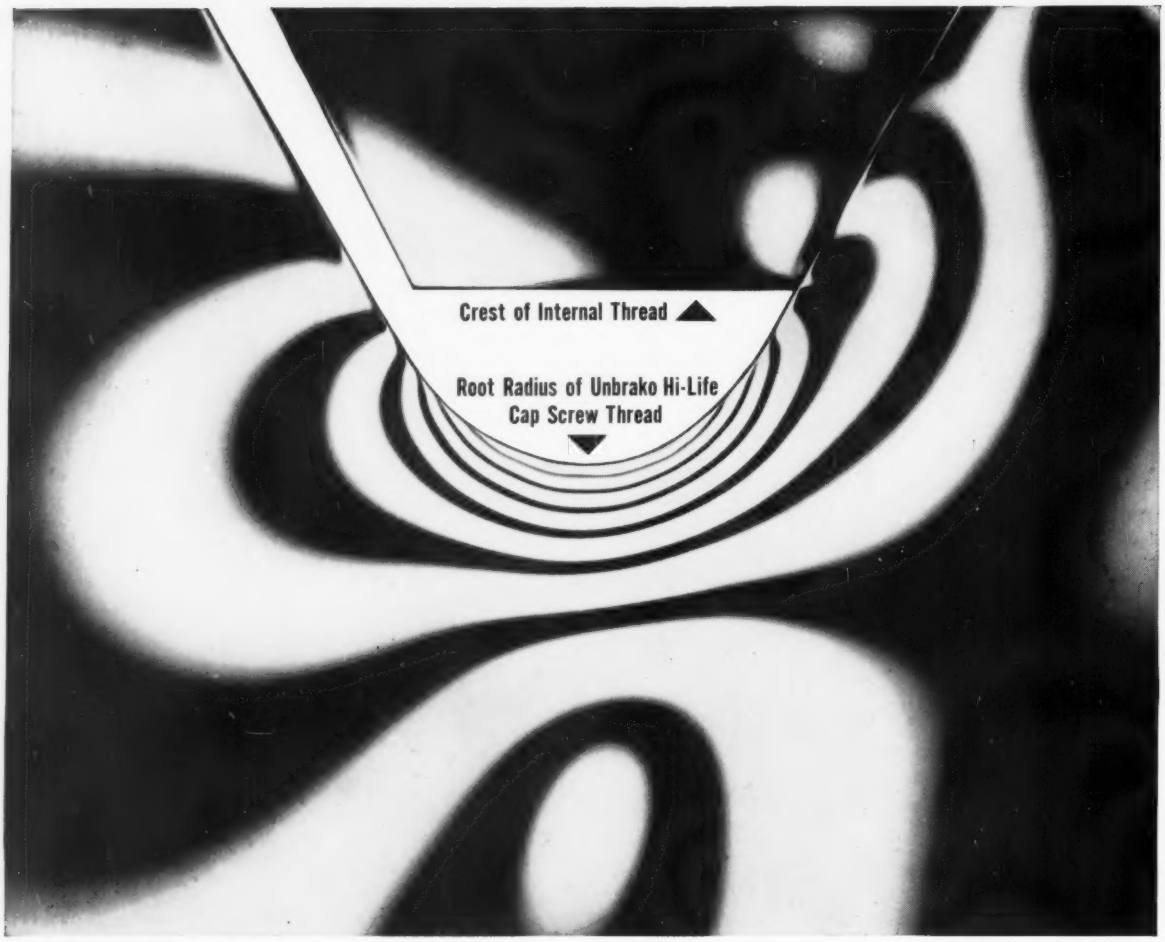
The big change is in the threads



STRESSES ARE DISTRIBUTED. Photoelastic study shows how the thread root radius of the new UNBRAKO Hi-Life socket cap screw blends smoothly into the flanks of the threads to reduce stress concentration and increase fastener fatigue life.

Improved thread root form, developed by SPS research on high-strength fasteners, now standard on all new UNBRAKO Hi-Life socket head cap screws. And at no increase in price.

Radiused thread root lengthens fatigue life as much as 100% and increases tensile strength of new UNBRAKO Hi-Life socket cap screws. For the first time, this high-strength thread design is available to industrial users. Higher reliability of new fasteners provides assurance of longer life for your product. Bulletin 2577 gives complete details. Ask your authorized SPS industrial distributor for a copy. Or write SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium.

INDUSTRIAL FASTENER Division SPS

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Water Wash: Mobilplex EP clings to surfaces even under direct water washing; also resists mild acids, metal-working emulsions.

Heat: Mobilplex EP holds consistency, resists runout at temperatures in the range of 300 F. Can be pumped at sub-zero temperature, has low shear resistance.

Extreme-Pressure: Mobilplex EP has shown excellent results in Timken OK-Load, 4-Ball Wear and similar tests. It has unusual capacity to withstand severe shock loads as evidenced by outstanding performance in heavy-duty equipment.

LABORATORY TEST SUMMARY RESULTS
MOBILPLEX EP (M) and 5 Leading Competitive EP Greases (A,B,C,D,E)

PROPERTY EVALUATED	RATING			
	Excellent	*Good*	*Fair*	*Poor*
Heat Resistance	M	A	C,D,E	B
Service Performance	M	A,C,E	B,D	
Extreme Pressure	M,A,C	B,D,E		
Anti-Wear	M,A	B,C	D,E	
Rust Protection		M,B,C, D,E		A
Water Resistance		M,B,C	A,D,E	
Handling Properties		M,A,B C,D,E		
Controlled Bleeding		M,A,C	B,D,E	
Non-staining		M	A,B, D,E	C

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The unique Calcium EP Complex, special additives and extremely tenacious nature of Mobilplex EP, provide maximum protection against wear, rust, washout and heat. Because of its greater versatility, Mobilplex EP goes further than competitive extreme-pressure greases in simplifying your lubricant application, storage and purchasing problems. This new-type lubricant has given industrial machines greater protection while replacing as many as seven other greases. Mobilplex EP has all of the advantages usually associated with EP greases—as well as excellent storage, structural and oxidation stability.

Examination of the laboratory summary at left shows that in comparison with five leading extreme-pressure lubricants Mobilplex EP is the *only* grease excellent or good in every grease quality tested. No wonder aluminum and steel plants, forging and metal-drawing shops, the cement, chemical and rubber industries, steel and paper mills are reporting dramatic success with Mobilplex EP.

For full details contact your Mobil representative.

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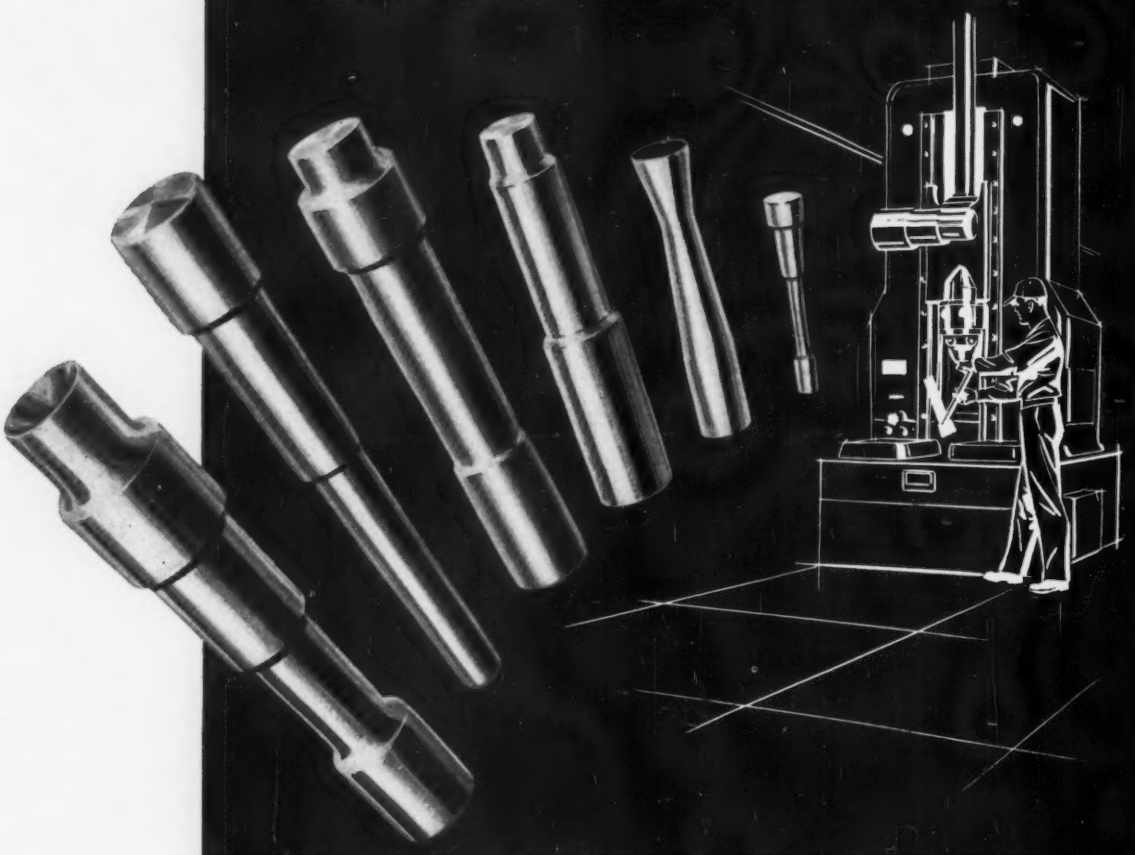
Two big advantages!

CURMET Rotary Forging stops strength loss in premium alloys - cuts scrap loss up to 57%



One prominent manufacturer saved 37½% in "K" Monel bar costs—found that the characteristics of the metal were vastly superior when it was CURMET rotary forged rather than machined. Other users report 25% . . . 13½% . . . 38% . . . even 57% saved in premium quality alloys—and the same improved properties in the finished product.

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When you require multi-diameter forgings measuring up to four inches and not over four feet in length—investigate CURMET rotary forging. The Curtiss-Wright engineer will be pleased to estimate *your* savings. And he will give you more information on the superior properties that the process achieves in metals.

Write us now for the completely new brochure on the CURMET rotary forging process.

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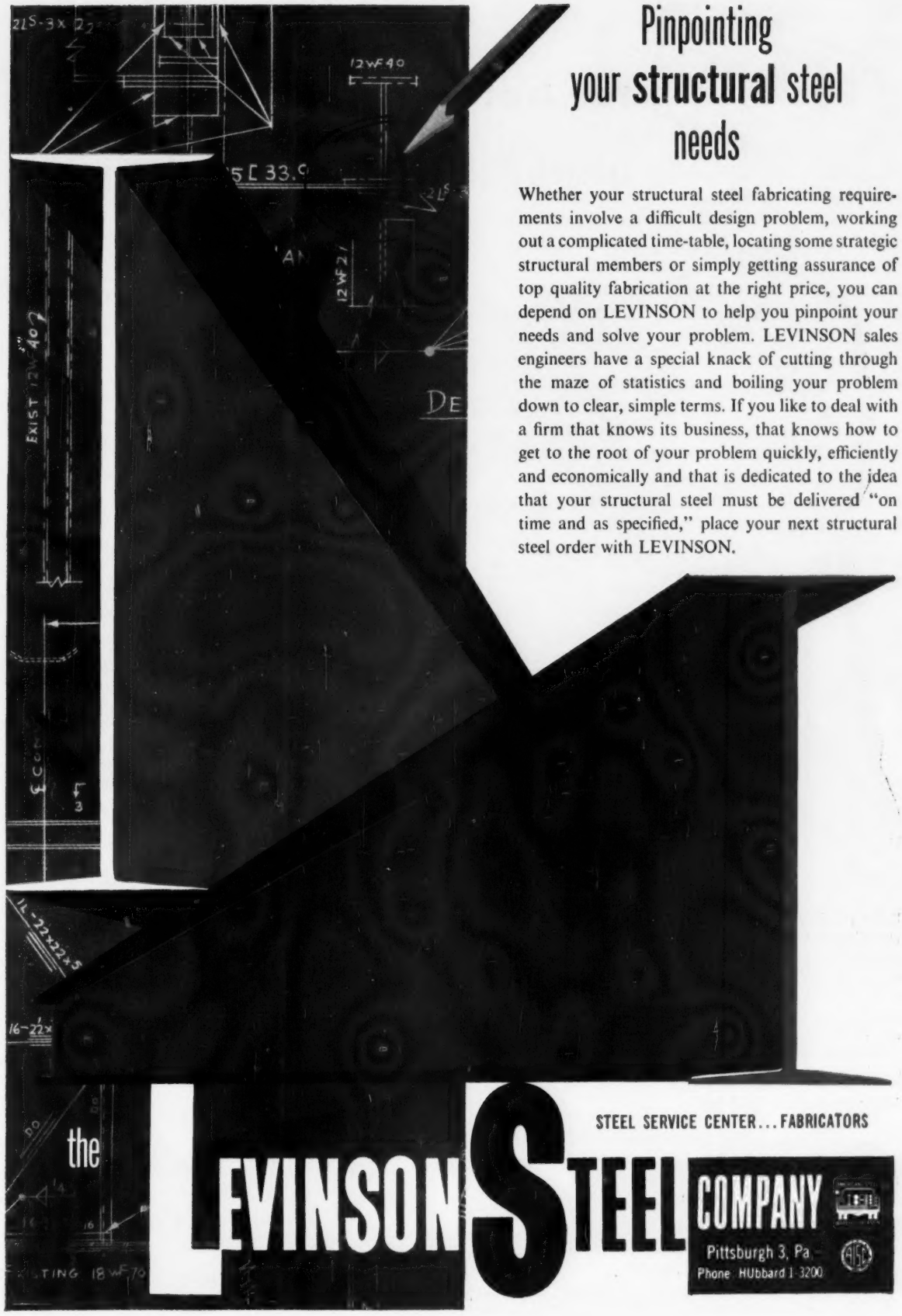

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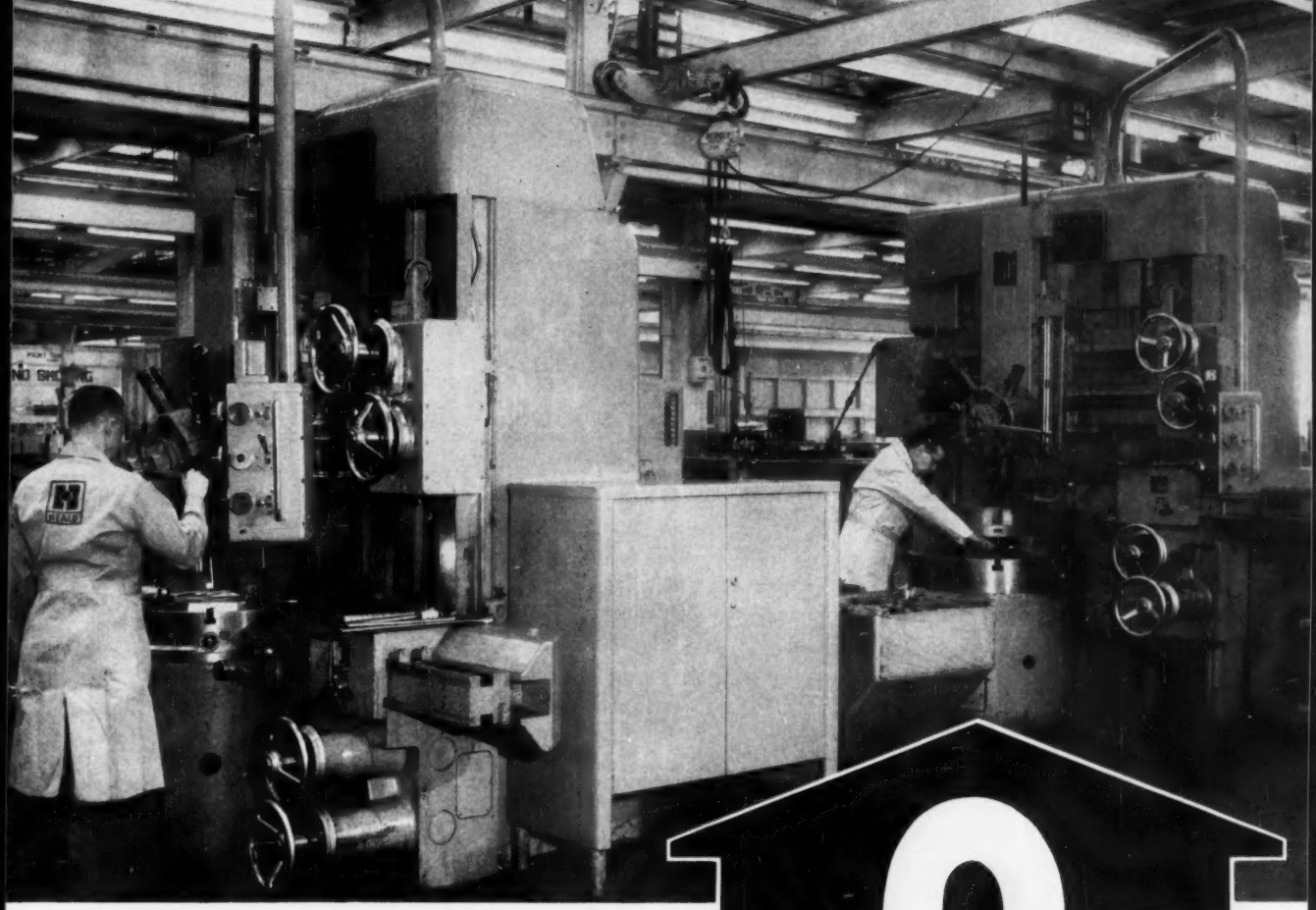

IT PAYS TO REPLACE . . .

A study of the production factors at The Heald Machine Company, Worcester, Mass., pioneer New England builders of precision machine tools, indicated that two Bullard Cut Master V.T.L.'s, Model 75, would produce as many parts, in any given period, as four Bullard V.T.L.'s of an earlier design.

when 2 do the work of four

In actual production, these additional advantages have been experienced:

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This all adds up to more parts at less cost per piece.

Perhaps an analysis, by a Bullard Sales Engineer, of your machining procedures will reveal "hidden savings" for you.

Why not ask him or write.

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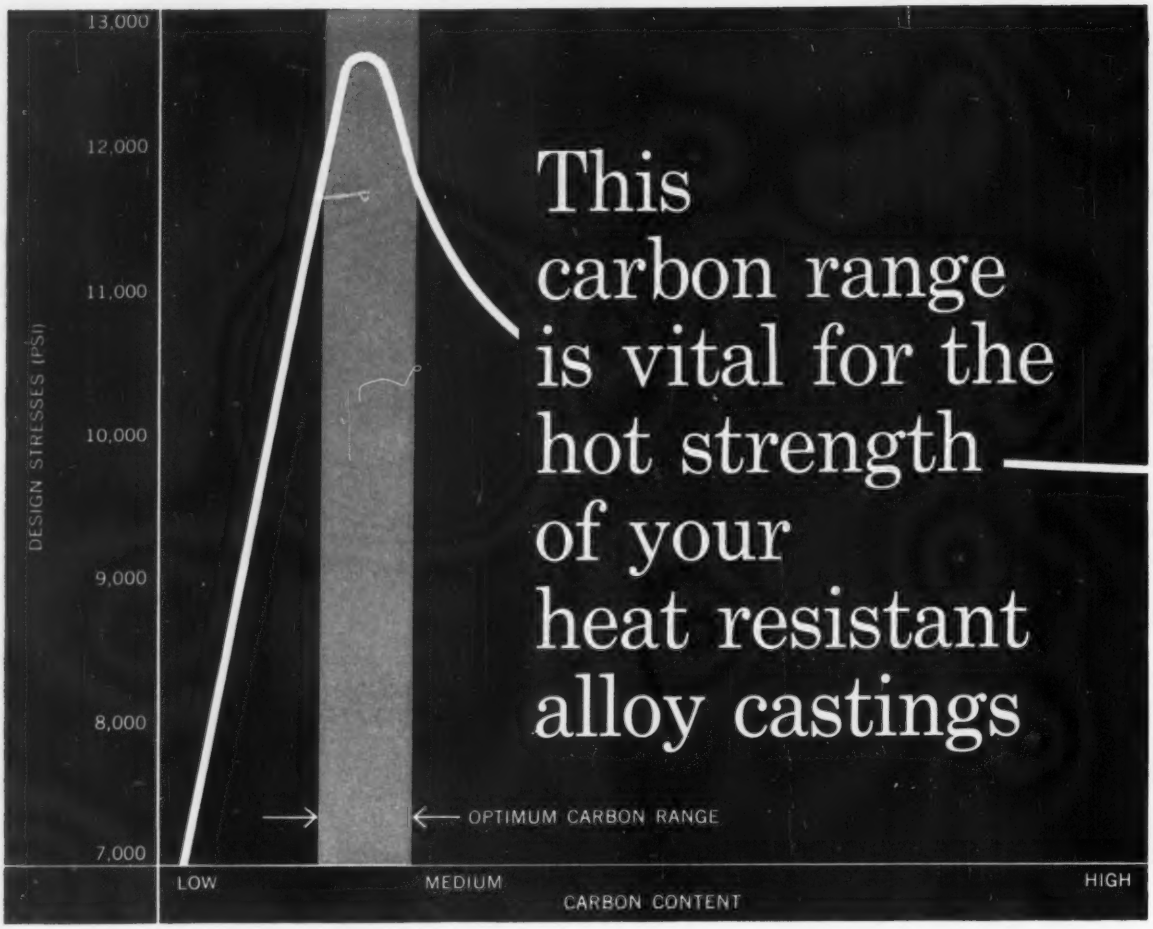


This carbon range is vital for the hot strength of your heat resistant alloy castings

Every foundry heat is analyzed to insure specified alloy composition

This graph illustrates the effect of carbon content on the hot strength of a heat resistant alloy. It outlines an optimum carbon range. The graph shows how a carbon content outside the optimum range would seriously lower the hot strength decreasing the service life of the casting. The optimum carbon range is 0.10 percent.

Controlling carbon content to within one-tenth of one percent is difficult, but Electro-Alloys does it. Compositional control of castings at Electro-Alloys is exact and painstaking. Without this care you cannot expect maximum efficiency and long service life.

We have compiled an imposing file of data on the effects of carbon in alloy composition, and we can relate that data to your needs. To stop rising replacement and maintenance costs, check with us on carbon content while equipment is in the design stage. Contact Electro-Alloys Division, 1029 Taylor Street, Elyria, Ohio, and we will take all steps to insure the optimum composition for your casting.

AMERICAN Brake Shoe COMPANY **ELECTRO-ALLOYS DIVISION • Elyria, Ohio**

GREENLEE

Automatic News

VOLUME XXI NO. 9 PUBLISHED BY GREENLEE BROS. & CO. ROCKFORD, ILLINOIS, U.S.A. SEPTEMBER, 1959

ARMATURE SHAFTS MACHINED ON AIR-FEED AUTOMATIC

The Harley-Davidson Motor Co., is well known throughout the world for its complete line of motorcycles and motor-scooters. The latest addition to their line is the new Topper motor-scooter. Advanced design and quality craftsmanship, plus wise application of modern production machines and tooling techniques, have won this company wide recognition for their products.

Many of the precision parts for these motorcycles and motor-scooters are made on the nineteen Greenlee Automatic Bar Machines shown in the photograph. An excellent example of this is the 8-15/16 inch long generator armature shaft shown in the tooling layout.

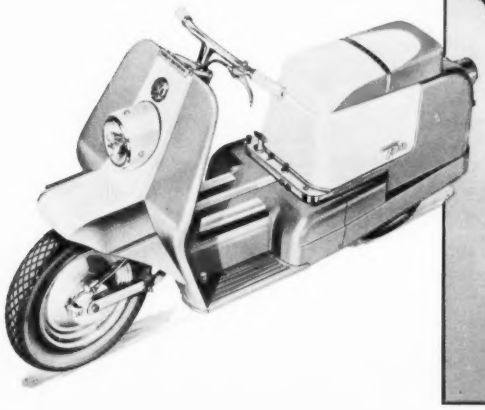
This part is machined on a standard 2″- 6 Air-Feed Bar Automatic at a gross production rate of 53 pieces per hour with High Speed Steel tools. It is machined from 13/16 inch round stress-proof steel at a spindle speed of 517 rpm, producing 112 sfm on the outside diameter of the stock. A 2-7/8 inch tool slide is used with a .0051 inch feed on the endworking tools.

The part is fed out 9-1/8 inches in the first position against a live-center receding stock-stop. When the stock contacts the stock-stop the collet closes and the stock-stop moves away from the end of the bar, permitting the stock to rotate freely and index to the next position. The movement of the stock-stop is controlled by a small air cylinder mounted on the gear box. After the stock is fed out the .773-.777 inch diameter and a small section of the .608 inch diameter is formed.

The .608 inch diameter is roller turned halfway and the backend of the part is rough formed in the second position. A three roll roller rest mounted on the tool slide in the third position supports the work piece while the remainder of the .608 inch diameter is roller turned and the backend is finish formed by a standard dovetail form tool.

In the fourth position the .573 inch diameter is roller turned and the end faced with an auxiliary turner. A flat form tool breaks down for cut-off and forms a 45° bevel on the front end of the next piece. The purpose of this bevel is to provide a better starting condition for the roller turner in the second position. The .522 inch diameter is turned with a standard roller turner and chamfered by an auxiliary turner and the .773-.777 inch diameter is finish formed in the fifth position. The machining operations in the fourth and fifth positions are supported by standard three roll roller rests. The part is cut off in the sixth position.

The Topper has a one-cylinder two-cycle engine with a fully automatic transmission. Gets up to 100 miles per gallon.



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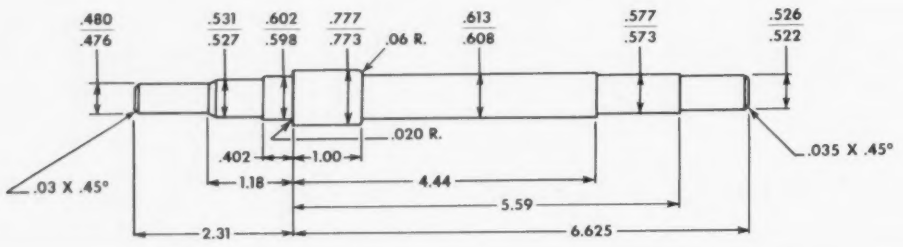
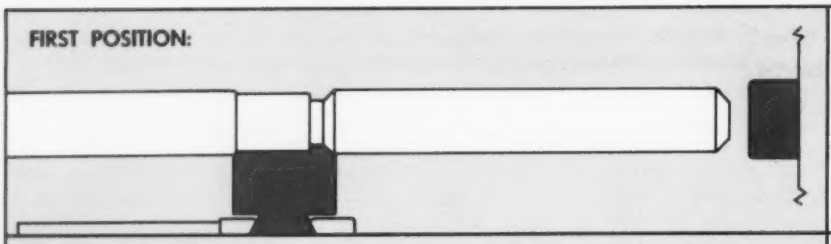
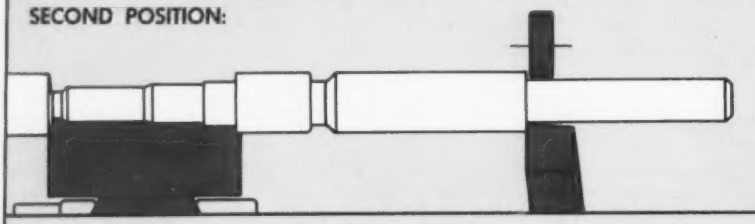
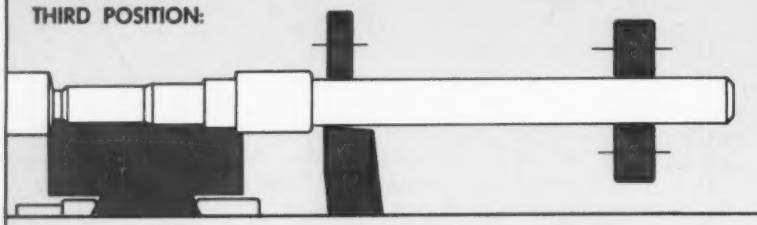
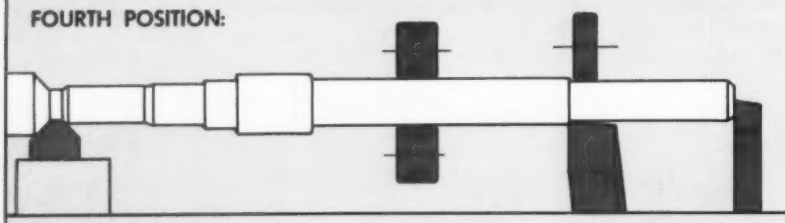
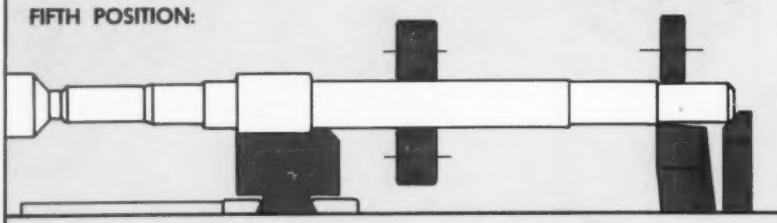
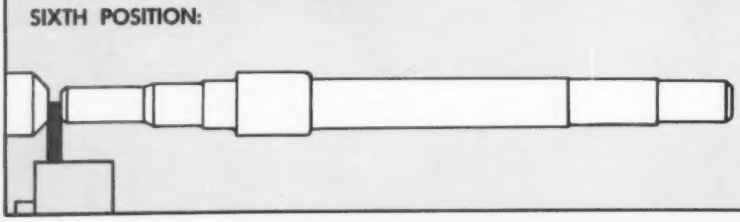
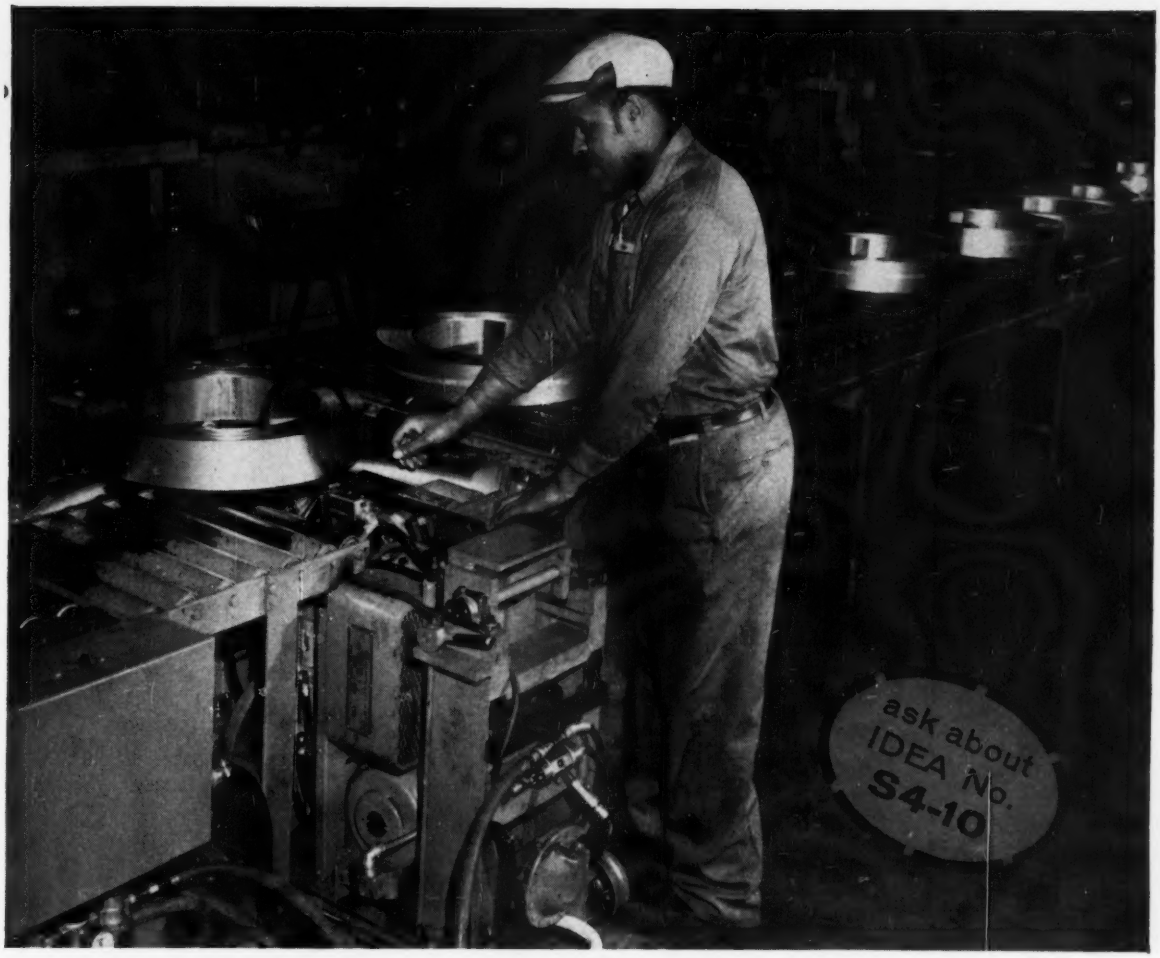


		FEED	SFM
FIRST POSITION: 	1. Feed out to 9⅛″	—	—
	2. Rough form .773″-.777″ and .608″ diameters	.0051	112
	Cam ratio: 6:1		
SECOND POSITION: 	1. Roller turn .608″ diameter half way	.0051	112
	2. Rough form backend and breakdown for cutoff	.0008	112
	Cam ratio: 6:1		
THIRD POSITION: 	1. Roller support on .608″ diameter (3-roll)	—	—
	2. Roller turn .608″ diameter to required length	.0051	112
	3. Finish form backend	.0008	105
	Cam ratio: 6:1		
FOURTH POSITION: 	1. Roller support on .608″ diameter (3-roll)	—	—
	2. Roller turn .573″ diameter	.0051	83
	3. Face end	.0051	78
	4. Breakdown for cutoff and form 45° bevel on the front end of the next piece	.001	64
	Cam ratio: 5:1		
FIFTH POSITION: 	1. Roller support on .608″ diameter	—	—
	2. Roller turn .522″ diameter	.0051	78
	3. Turn .035″ x 45° chamfer	.0051	71
	4. Finish form .773″-.777″ diameter	.0008	105
	Cam ratio: 6:1		
SIXTH POSITION: 	1. Cut off	.002	56
	Cam ratio: 2:51		

If you wish to receive AUTOMATIC NEWS regularly, write Greenlee Bros. & Co., Rockford, Ill.



Plan with your AIM*. . . Edgcomb Steel and Aluminum does . . .

Powered Machine aids effortless coil strapping

EDGCOMB STEEL AND ALUMINUM CORPORATION, HILLSIDE, N. J., and their Acme Idea Man developed a faster, easier way to handle and strap heavy coils of steel with the new Acme Steel F4 Strapping Machine and Indexing Table. (Idea No. S4-10)

Now Edgcomb Steel and Aluminum has doubled its coil strapping capacity and saves about eight man-hours per shift. Power lifts the coil above the indexing table top on three tapered rollers that rotate the coil for strap placement. The F4 tensions each strap to predetermined tightness, seals and cuts it. The F4 has unlimited strap feed and take-up, and makes its own seals from a coil.

Acme Idea Man, C. A. Lested, serves many companies with time and money-saving ideas.

Ask your Acme Idea Man to show you the new 10 minute movie on this equipment.

***Plan with your Acme Idea Man.** Backed by Acme Steel engineers, he can help adapt Acme Steel Strapping Machines to your needs. Call him or write: Dept. SDS-99, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Limited, 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

TEXACO ORGANIZED LUBRICATION CAN HELP YOU . . .

End replacement parts waste

One Northeastern manufacturer replaced parts in a major machine every two weeks —a not uncommon practice in industry today. He marked it off as a normal maintenance expense. It wasn't really—it was the result of faulty lubrication practices. A Texaco Lubrication survey spotted the trouble—solved the problem. Now the manufacturer operates with a Texaco Organized Lubrication Plan—and the trouble no longer exists.

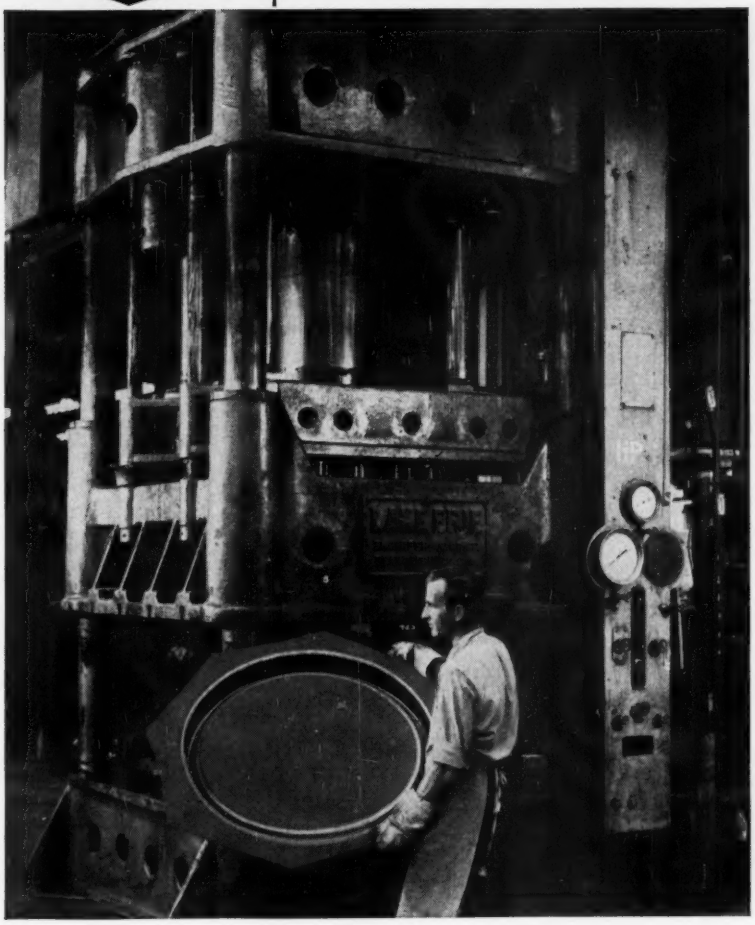
Chances are the same thing is happening in your plant right now—It doesn't have to. A Texaco Organized Lubrication Plan can extend parts life significantly—saving thousands of dollars in replacement parts and even more in uninterrupted production for longer periods.

Get full details on Texaco Organized Lubrication from your local Texaco Lubrication Engineer. He can supply you with a copy of "Management Practices that Control Costs via Organized Lubrication." Or write:

Texaco Inc., 135 East 42nd Street, New York 17, N.Y., Dept. S-111.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

DOW | METAL PRODUCTS



400-TON PRESS draws end pieces of magnesium transmitter housing for missile ground support electronic system. Heated dies make possible one step draws.

The electronic transmitter housing shown in various stages of production on this page is a good example of the type of work carried on at Dow's fabrication plant. It is a large and complex assembly which is produced in quantity, involves many different operations, and must conform to extremely high quality standards.

Large or small jobs. The fabrication plant is a large, well equipped production facility set up to handle large or small jobs, and plenty of both. Its activities encompass every phase of fabrication — deep drawing, bending, spinning, stamping, piercing, machining, arc and spot welding, assembling, chemical treating and painting. The facilities are government certified.

Engineering and quality control. Dow engineers working closely with the customer are frequently able to suggest design modifications which cut costs and/or meet application requirements better. A quality control team using modern methods and equipment assures that high standards of craftsmanship are rigidly maintained.

Many "firsts". The fabrication plant has pioneered many developments in the production of magnesium parts and products. They were first to hot draw the lightest structural metal, and first to spot weld and automatically weld it. They have also been a leader in the production use of chemical treatments and finishes for magnesium.

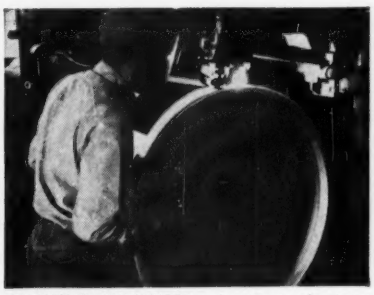
Whatever your requirements, if they involve fabricated Magnesium Aluminum parts or assemblies, it will pay you to make Dow your supplier.

ARE YOU UTILIZING DOW'S EXTENSIVE FABRICATION FACILITIES?

Dow, primary producer of magnesium and its alloys, offers capacity and outstanding capabilities of its Metal Products Fabrication plant.

WRITE TODAY for this illustrated brochure discussing Dow fabrication services. THE DOW METAL PRODUCTS COMPANY, Midland, Michigan, Sales Department 1312LE9-14.

"WRAPPER", or shell of housing is roll formed of magnesium sheet.



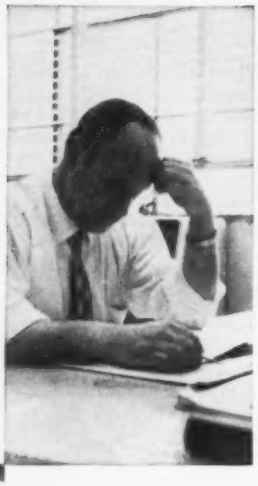
AUTOMATIC ARC WELDER, using tungsten-inert gas process, joins end to wrapper.

ASSEMBLY involves attachment of doors, hardware, other components using riveting, bolting, welding.

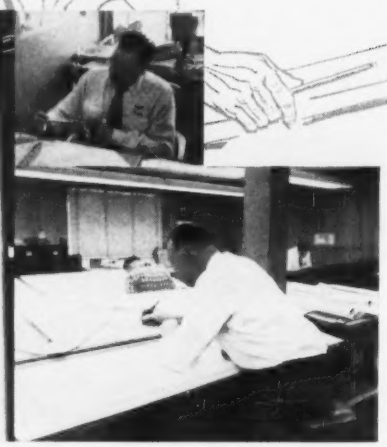
THE DOW METAL PRODUCTS COMPANY, Midland, Michigan

DIVISION OF THE DOW CHEMICAL COMPANY

plating progress ✻



UDYLITE ENGINEERING TEAM



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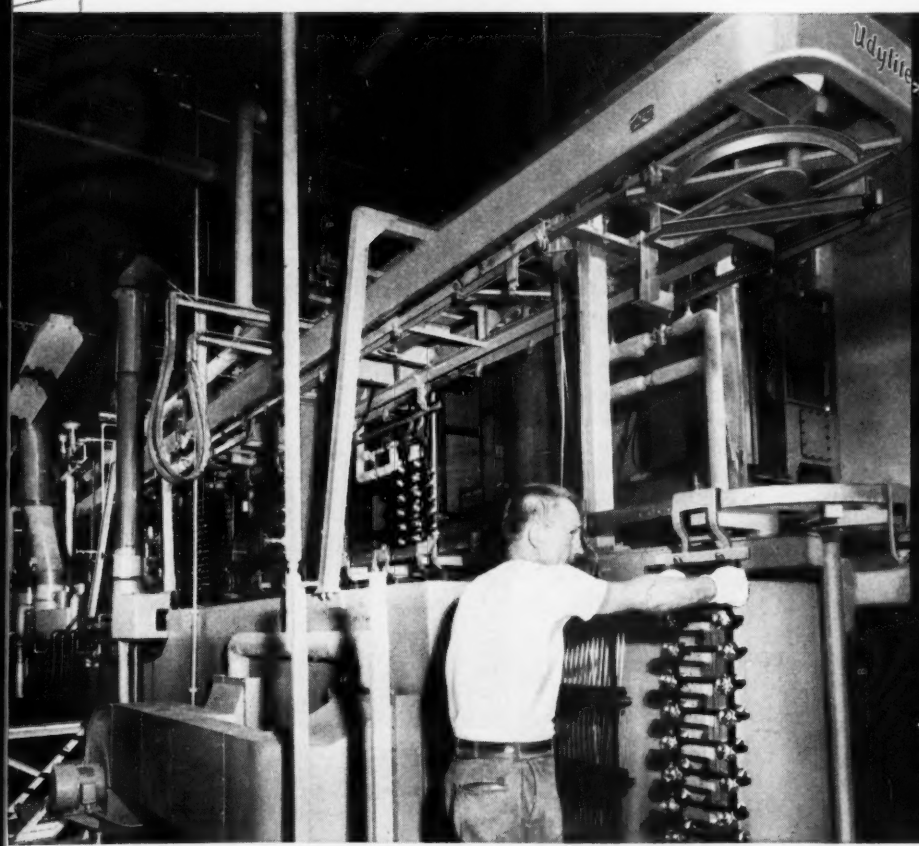
When our engineering design team goes to work on a problem it draws upon practical experience — yours and that of others in the industry added to our own well-tested knowledge. In our forward planning of new and better equipment to meet those problems we give full consideration to proven methods presently in use as an aid in directing our research. We then look for *a better way*.

The top minds of the electrical, engineering and chemical fields who form the team are constantly striving to provide you with speeded production, improved plating quality and, importantly, reduced labor and operating costs.

The result of their advanced thinking, of countless pilot machine models built, torn down and rebuilt, of exhaustive experimentation and testing is the finest, most efficient and carefully engineered plating equipment . . . designed by Udylite to produce top product and top profit for you.

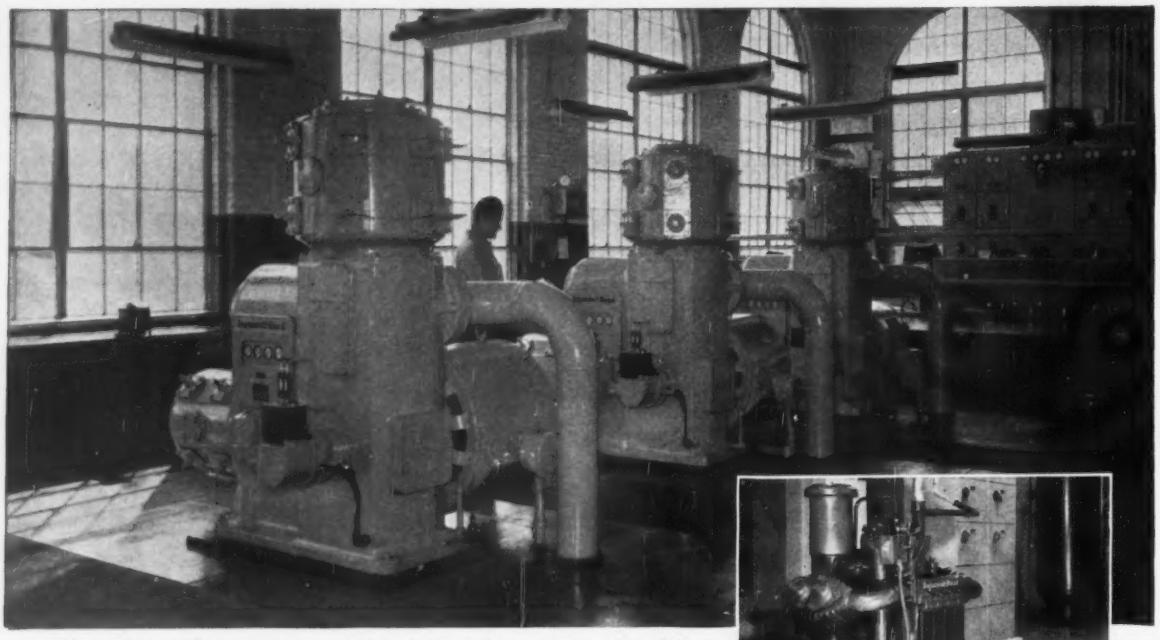
ANSWERS INDUSTRY'S PROBLEMS

. . . meeting the demand for high productivity.

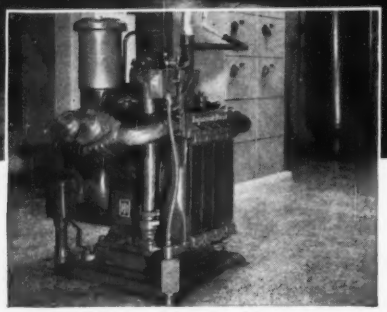


* American Standard Plumbing & Heating Division at Cincinnati installed a Udylite Cyclemaster full automatic for deposition of nickel and chromium on brass fixtures. Results: 1. quality control to meet their exacting top standards—2. production far beyond expectations—3. a savings of almost half the floor space previously used and—4. rejects are almost non-existent. Bonuses: Ultrasonic cleaning included in this Cyclemaster eliminated certain degreasing operations formerly needed to remove buffing compounds from threads. And, here Udylite Plastisol coatings applied to all exterior tank surfaces insure long life with minimum maintenance. *Again*, the Udylite Engineering team meets specific customer's problems with applied knowledge and experience.

How to squeeze more profits out of your COMPRESSED AIR POWER



Three 125-hp XLE compressors generating air power for a weapons plant. This compact two-stage unit features pipeless Thru-Frame air flow and full-floating aluminum bearings which never need adjustment. Sizes 125 to 350 hp. (Other I-R air compressors to 4000 hp.)



This air-cooled two-stage Type 40 compressor is one of several furnishing plant air and instrument air in a power plant. Sizes 25 to 125 hp. (Others from ½ hp.)

Make sure you have enough pressure at point of use—and extra dependability at point of generation

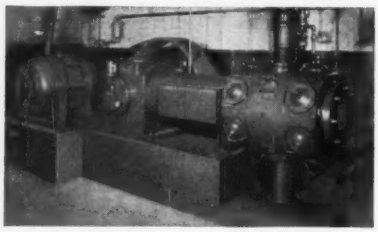
Cost-conscious plant engineers and production men know that to get the full savings inherent with air-powered equipment, you must have full air pressure at every tool.

But it's equally important to guard against unscheduled shutdowns where your air power is generated. This problem can best be solved at the time of purchase, by specifying compressors that have an extra margin of safety against mechanical troubles.

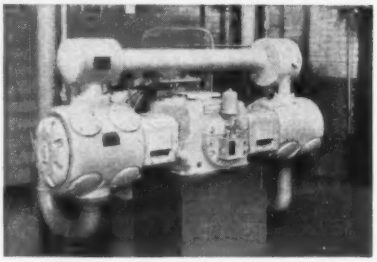
Ingersoll-Rand compressors have that extra safety margin built in. They'll stay on the job longer, with minimum attention and maintenance. Take valves, for example—the most "vulnerable" point in any compressor. Only I-R compressors have Channel Valves, known the world over for efficiency, quiet operation and long life. Their exclusive air-cushioned action eliminates impact and greatly reduces wear.

Also in I-R compressors, all running parts are sealed against dust and dirt which might cause wear. The seal need never be broken, since bearings are a type which will never need adjustment.

For top compressor performance and long-run economy, specify Ingersoll-Rand. And ask your I-R representative to show you how to get your maximum "*Dividend on Payroll Dollars*" with a Planned Annual Review of your air power system.



Ingersoll-Rand's new ESH horizontal compressor, here in a tool factory. Sizes 20 to 150 hp. Also built as vertical unit, called ESV.



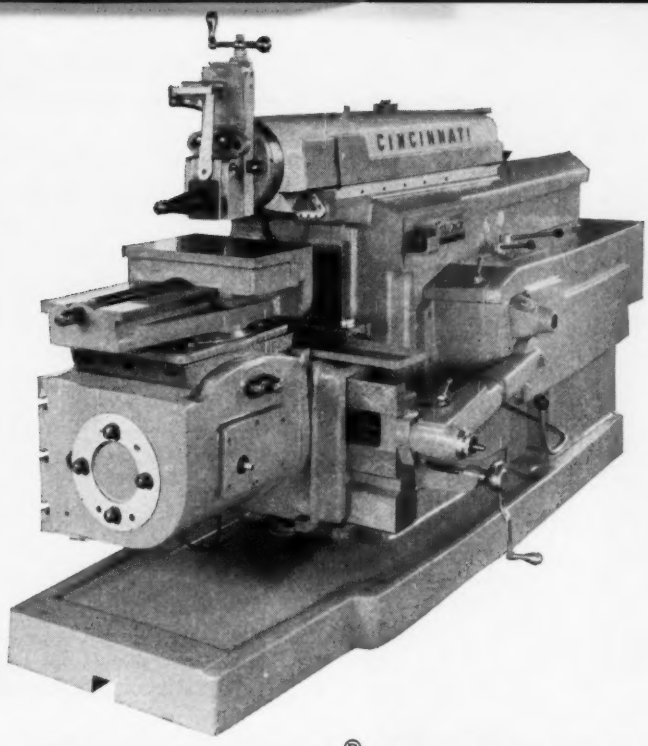
Two-stage balanced-opposed PHE compressor handling air in a gas plant. Also built as L-design unit with packaged intercooler. Sizes 75 and 100 hp.

Ingersoll-Rand

1-915

11 Broadway, New York 4, N. Y.

COMPRESSORS • GAS & DIESEL ENGINES • PUMPS • AIR & ELECTRIC TOOLS • CONDENSERS • VACUUM EQUIPMENT • ROCK DRILLS



Cincinnati® Shaper standard features: extra savings at no extra cost

Cincinnati Shapers give you so many money-saving features per dollar invested that they can be the most profitable equipment in your shop.

1. This 2″ cut, .030″ feed on a 24″ H. D. Cincinnati® Rigid Shaper, demonstrates the ability of the 50 psi automatic lubrication system to maintain oil films under heavy leads.

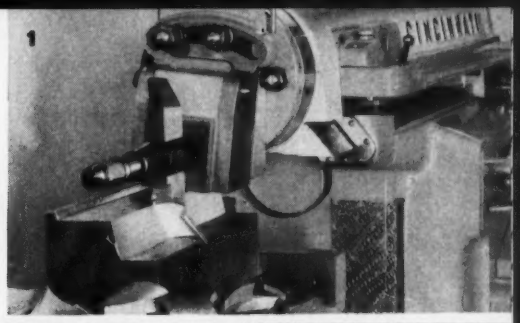
2. Brushless electromagnetic brake and clutch insure fast, easy operation. No adjustment is required.

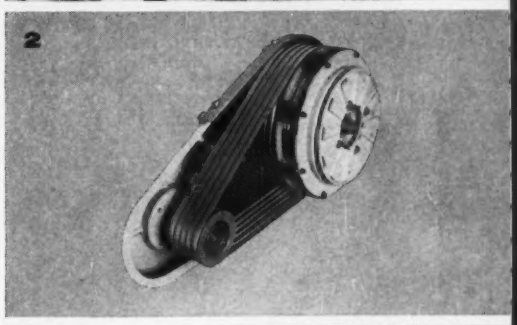
3. Both vertical and horizontal rapid traverse are standard Cincinnati features which substantially reduce setup and cutting time.

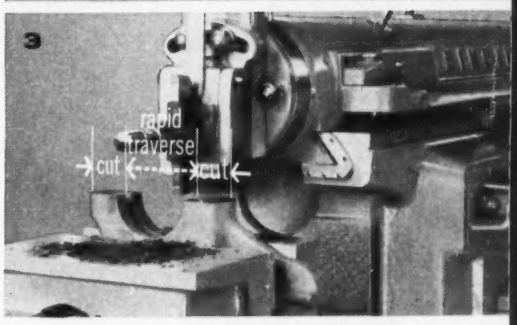
4. Extended ramway bearings increase ram support and minimize wear. Full table clearance to the column gets work closer to the column, minimizes overhang.

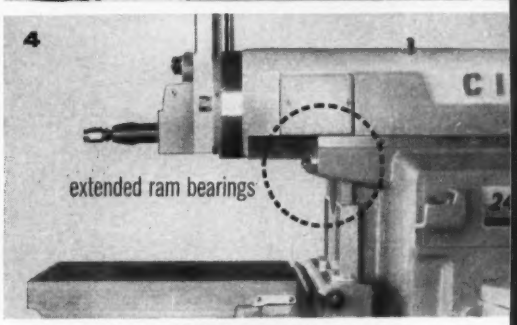
5. The vee ramways are integrally cast with the column. Ramway rigidity is increased by eliminating joints. Full length tapered gib provides for easy adjustment, maintains accuracy.

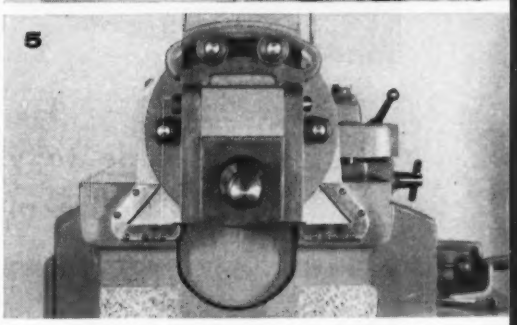
Write Dept. C for Catalog N-7.











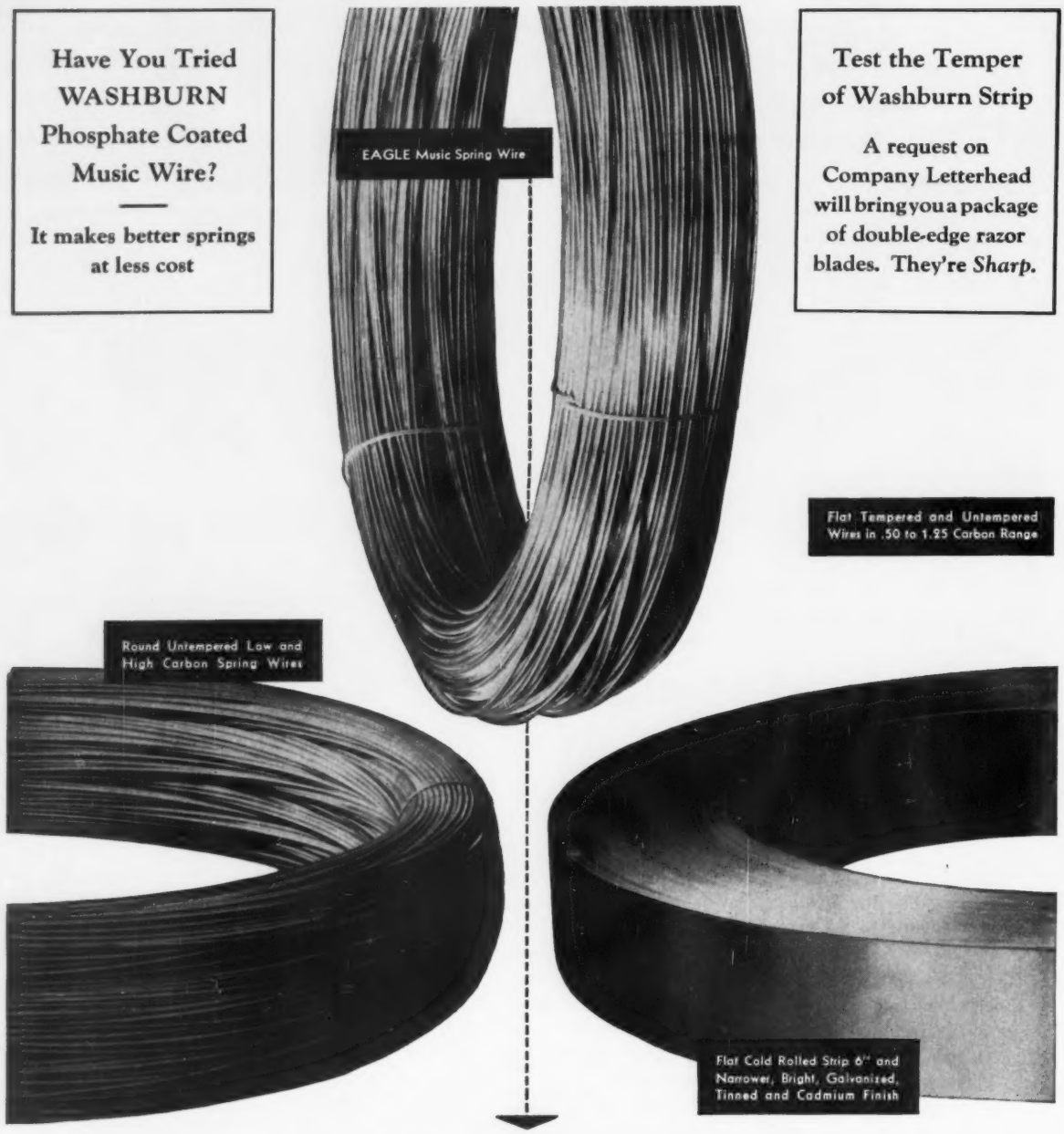
Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio

Have You Tried
WASHBURN
Phosphate Coated
Music Wire?

It makes better springs
at less cost


EAGLE Music Spring Wire
Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range
Round Untempered Low and High Carbon Spring Wires
Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish

Test the Temper
of Washburn Strip

A request on
Company Letterhead
will bring you a package
of double-edge razor
blades. They're *Sharp.*

Here is the Washburn Wire Family
made to your specifications to insure the
Quality of YOUR Product

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WASHBURN

WASHBURN WIRE COMPANY NEW YORK CITY
CLEAN, UNIFORM BILLETS – STRIP – RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

No. 1 and No. 2 Hot-Dip Galvanizing Lines, Martins Ferry Plant, Wheeling Steel Corporation

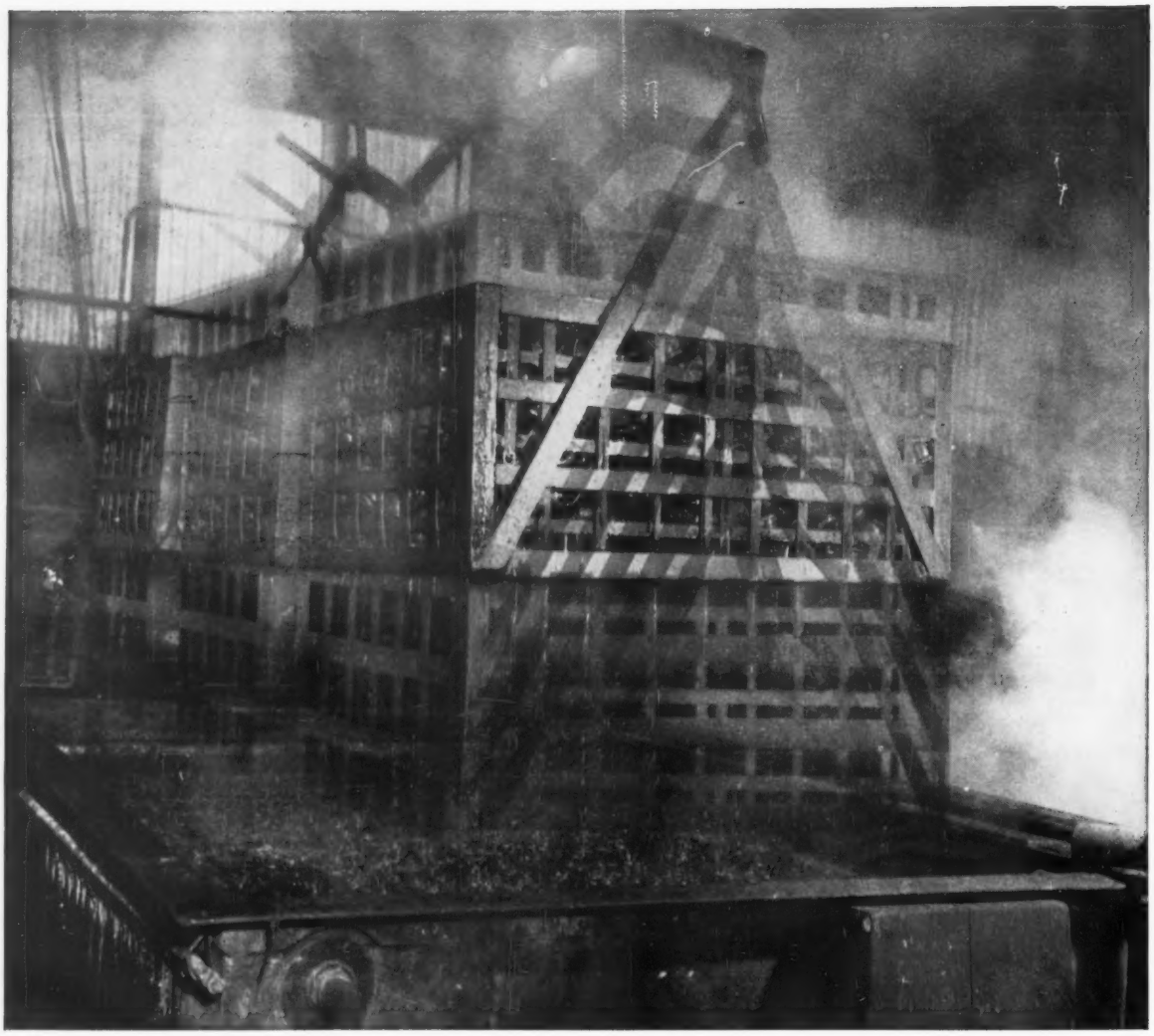
Wean, Wheeling and Galvanizing . . .

The advantages of corrosion-resistant, zinc-coated sheets might well have been lost to history had it not been for the development of continuous, hot-dip galvanizing lines. Such lines brought galvanized sheets within the rigid limitations of acceptable product and did so at much lower operating costs.

The Wean Engineering Company worked in close cooperation with the Wheeling Steel research department on the development, design, and construction of these lines at the Martins Ferry plant. The lines are currently producing a wide range of top quality galvanized sheets and coils at speeds up to 300 fpm.

Wean has designed and built galvanizing lines for a wide variety of customer requirements. Why not take advantage of Wean's *creative engineering* experience on your next coating line project.

THE WEAN ENGINEERING COMPANY, INC. • WARREN • OHIO



Dip-Dip-Dip for 20 yrs. Monel Alloy baskets do it!

These welded baskets of Monel* nickel-copper alloy strip carry up to 3100 pounds of carbon steel pipe protectors at Screw and Bolt Corporation of America.

First they're dipped in 6-8% caustic solution. Then in 6 - 8% sulfuric acid solution. Temperatures, 175° - 200° F.

For days, weeks, months, years – these baskets take this tough pickling service.

They take this tough service for up to 20 years! And more!

And this isn't just *one* case! It's typical of the long trouble-free service you can expect from Monel baskets. Gives you a pretty good idea of the *extra long service* you can expect from other Monel equipment, too.

Extra long service because Monel alloy resists corrosion by caustics and acids – resists "honeycomb" corrosion – keeps its high strength and ductility.

For your pickling equipment – from big baskets to small washers – Monel alloy will give you the economical service you want *and need*. Get the complete story. Write Inco for your copy of "Equipping the Pickling House for Greater Production and Lower Cost."

*Inco Trademark

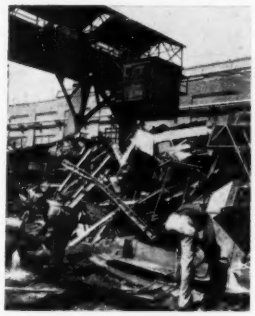
HUNTINGTON ALLOY PRODUCTS DIVISION
The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

MONEL®

Metalworking Outlook

September 14, 1959

Scrap Outlook Firm Despite Strike



Although users' stocks have declined moderately in almost two months of steel strike, the steel scrap industry anticipates a steady market well into 1960. No price skyrocket will mark the end of the strike. Two factors point to firm prices: 1. Fabricators are generating big quantities of industrial grades. 2. Strikebound steelmakers are quietly buying for delivery after the startup. Users' stock are estimated at 8 million gross tons vs. 8.1 million on June 30 (Page 233).

Partmaker Brings Out a Small Car

The Big Three and Little Two will be joined by a Tiny One in introducing small cars this fall. Crofton Marine Engine Co., San Diego, Calif., has started production of a small utility car called the Bug. It looks like a half-size wartime Jeep, but weighs only 1100 lb and will sell for $1350 at the factory. Wheelbase: 63 in. Over-all length: 111 in. Width: 48 in. It's powered by a 35 hp, overhead cam, four cylinder, Crofton gasoline engine. The firm expects to produce 500 units the first year. Initial shipments are scheduled for the fourth quarter.

Detroit Ponders Steel Shortages

Automakers have a tough decision to make: Should they start hell-for-leather production now and hope the steel strike ends this month or take it easy and wait out the settlement? The problem is: Most builders have plenty of flat rolled stock but some galvanized and bar stock items are short and parts plants will be hurting by Sept. 30. Although prospects for October are good, two-thirds of the industry's plants will be pinched by November (Page 112).

Auto Previews for 1960

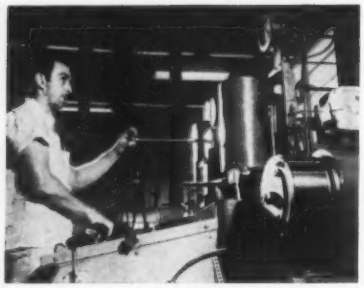
This week STEEL takes you behind the scenes of 1960 car and truck previews to highlight some of the details you can watch for in the new compact cars. Here are first hand driver test reactions on Chevrolet's Corvair and Ford's Falcon. Other features cover Chevy's new truck models, as well as Chrysler Corp.'s new electroluminescent lighting (Page 127).

Screw Machine Product Sales Grow

Expect sales of screw machine products to top $500 million this year. From the April, 1958, low to the June, 1959, high, sales climbed 55 per cent: The

average for other metal components was 54 per cent. The National Screw Machine Products Association says its products account for about 5 per cent of all components purchased by 70 large consuming industries: Shipments set a peacetime record in the first half.

New Technology Creates Shadow-Thin Metals

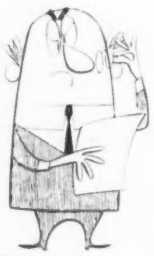


Ultrafine gage metal strip, some of it rolled as thin as 85 millionths of an inch, is responsible for smaller and more efficient computers and gages. Arnold Engineering Co., Marengo, Ill., rolls thin metal foil on a Sendzimir mill. The operator is guided by the curl of an edge or play of light on the strip surface to keep within specs (Page 166).

GE Contract Not a Rebuff to Westinghouse

Westinghouse Electric Corp. was "not surprised" that the Atomic Energy Commission contract to develop a pressurized water reactor (worth $18.5 million) was awarded to General Electric Co. "We were forewarned," a Westinghouse spokesman told STEEL. Several publications had interpreted the award as a rebuff to Westinghouse because it transferred some of its top scientific brainpower from atomic work to a space program. Westinghouse said that was a "false conclusion" arrived at through "erroneous assumptions." Westinghouse knew that the AEC would give more work to GE's Knolls Atomic Power Laboratory or risk the loss of some of the top men employed at that lab, it said.

Should You Lease Production Equipment?



Industrial equipment builders who add leasing arrangements to their kits of marketing tools can increase their sales potential by 10 to 20 per cent, says Nationwide Leasing Co., Chicago. Leasing's dramatic growth attests to its popularity. The value of leased equipment is expected to jump to $300 million this year compared with $227 million in 1958. A number of firms have profited from using the various methods of leasing. You may want to do likewise, but be wary of the pitfalls (Page 114).

Copper Prices to Climb More

If the copper industry strike lasts much longer, you can expect another price increase. The strike already has caused a 1.5 cents a pound jump in primary copper to 31.5 cents. (In turn, copper and brass fabricated products were upped 1.5 cents.) With dealer copper selling on the New York market for 33.75 cents and demand heavy, the move was expected. What was surprising: The hike was initiated by Copper Range Co. and its subsidiary, White Pine Copper Co., a relatively small producer with output of about

3000 tons a month. Anaconda immediately followed suit by announcing that it would bring in South American copper at 31.5 cents.

Kennecott May Not Move

As STEEL went to press, it appeared that Kennecott Copper Corp. would hold at the 30 cents a pound level. The company says it already has a substantial amount of blister copper in transit to this country, but has no immediate plans to divert further metal to the U. S. because of the threat of a Sept. 30 longshoremen's strike. The other member of the Big Three, Phelps Dodge Corp., is shut down by the strike. Expect more copper to be shipped in from overseas. Metalmen estimate that around 25,000 tons of refined metal is en route from Europe for September delivery.

Putting Employee Meetings to Work

Getting together with employees is one way more and more companies are getting an important message across. Management authorities advise that rising productivity in today's work force may depend heavily on improved communication between labor and the front office. This last article in STEEL's series on keeping workers happy deals with one of the best media for employee communication (Page 124).

Patent Progress Report

Volume of patents issued by the U. S. Patent Office has grown to about 1000 a week. Since the first patent law was enacted in 1790, about 2,891,000 patents have been issued. About 55 per cent of applications eventually become patents; 45 per cent are rejected.

Foundry Equipment Sales Head for a Record

Makers of foundry equipment sold about $39 million worth of their products during the first half of 1958; they sold about $73 million worth in the first six months of this year. Their incoming orders totaled about $36 million in 1958's second half; second half, 1959, orders are headed for a record $90 million mark. It means that 1959 incoming orders will probably be more than double those of last year—for a record performance. Price competition is subsiding in most lines. Foreign competition is toughening (Page 121).

Your State Tax Load Is Getting Weighty

On the average, you pay more than half again as much in state taxes today than you did ten years ago, reports Commerce Clearing House, Chicago. The

national per capita average reached a record $91.70 during the fiscal year ended June 30 (vs. 60 in 1950). Nebraska's $56 per person is the nation's lowest tax burden; Delaware's $150 is the highest. Among the large metalworking states, Illinois' $75 and Ohio's $78 are lowest, while California's $126 and Michigan's $103 are highest.

Automated Alloying Raises Steelmaking Efficiency

An automatic feeding device for measuring the alloying elements that go into ladles when open hearths are tapped is saving steelmakers metal and money. The machine, made by Blaw-Knox Co., Pittsburgh, weighs alloying metals electronically and adds them to the ladle at controlled rates. Twelve rates of feed make it possible to adjust additions to various tapping conditions. Additions are usually started when the ladle is 20 per cent full; completed when 80 per cent full (Page 172).

Rail Unions Offer to End Living Cost Clauses

Eleven railroad unions representing 700,000 nonoperating employees have offered to scrap the cost-of-living escalator clauses in their contracts. But, in return, they want a 25 cent an hour wage hike and an option to strike at any time. Rail officials say they want to get rid of the escalator clauses but not at the risk of losing the stability of a long term guarantee against new contract demands.

Guide to Christmas Giving

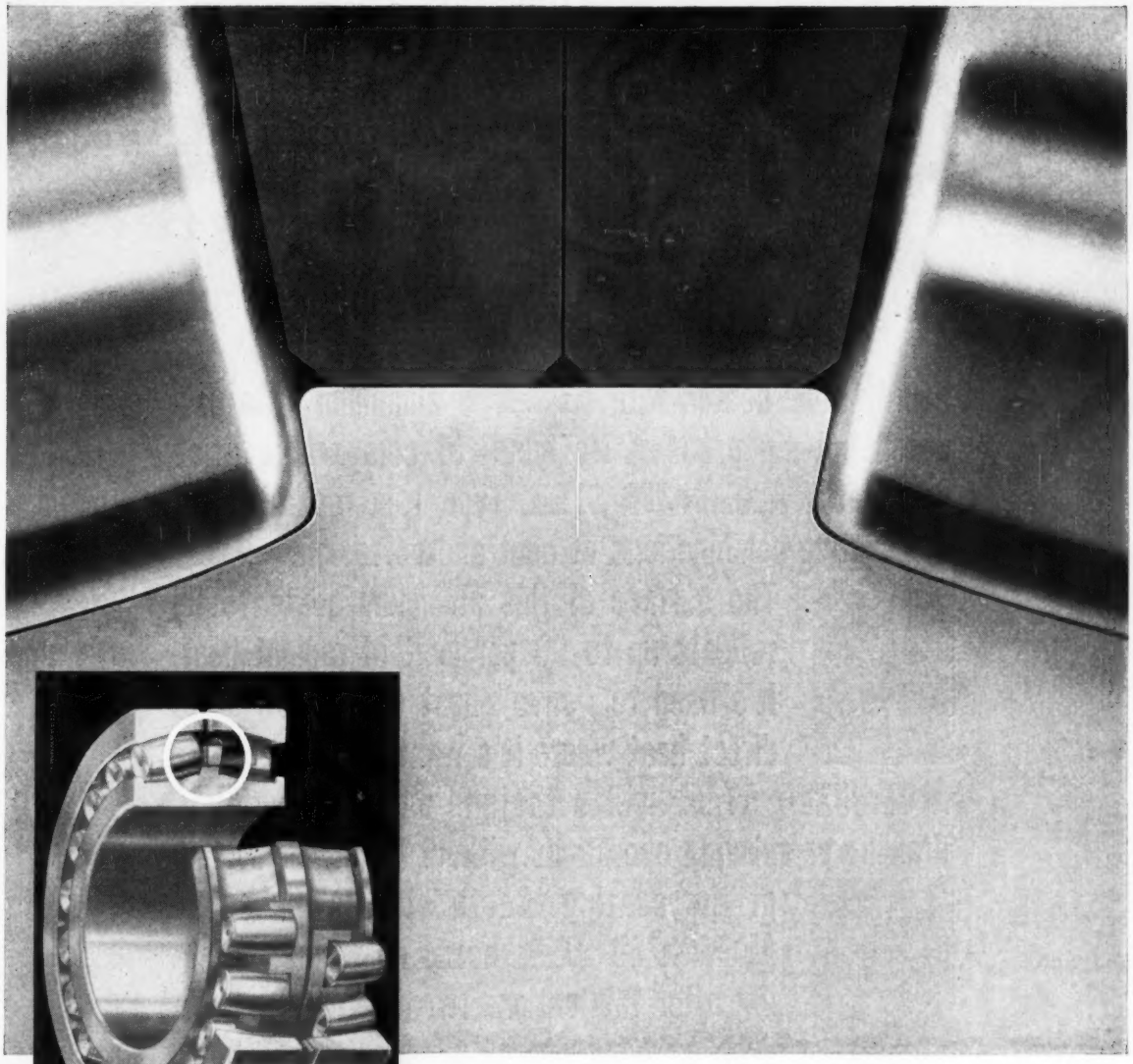
A group of sales managers, anxious to clear the air about business gifts, formed the Business Goodwill Advisory Council in Chicago. They've established some guideposts for Christmas presents: 1. Keep the value modest. 2. Choose the gifts individually according to the recipients' tastes. 3. Buy gifts that are useful and dependable. 4. Personalize each with the recipient's name or initials. 5. Package them securely and attractively. 6. Accompany each with a personal note or greeting card. 7. Deliver each gift with a flair—personally or by special messenger—to the recipient's home.

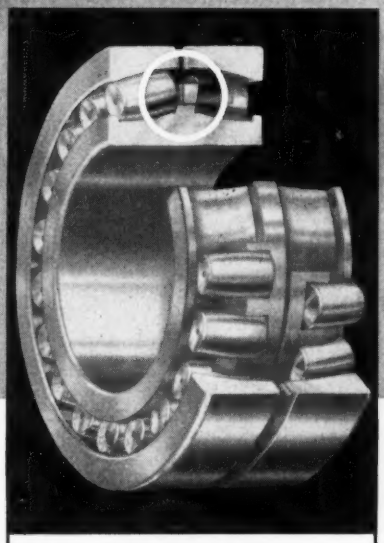
18 States Have FEP Laws

Fair employment practice acts are now on the law books of 18 states, reports Commerce Clearing House, Chicago. Ohio's became effective July 29; California's will go into effect Friday (Sept. 18). The laws generally forbid an employer or union to discriminate against individuals because of their race, creed, color, nationality, or ancestry. Six states also forbid discrimination because of age. They are Massachusetts, New York, Connecticut, Wisconsin, Oregon, and Pennsylvania.

Straws in the Wind

Sylvania Electric Products Inc. reduced prices an average of 7 per cent on tungsten contact, support, and ground seal rod . . . Minnesota has amended its tax laws to encourage development of some low grade iron ores.





TORRINGTON
Spherical Roller Bearings Offer:

- inherent self-alignment
- conformity of rollers to raceways
- integral center guide flange for stability
- positive roller guidance
- land-riding bronze cages
- maximum radial and thrust capacity
- controlled internal clearance
- electronically selected rollers
- even load distribution
- long, dependable service life

Send for new Torrington
Spherical Roller Bearing Catalog #258.

Keystone of Stability!

The integral center guide flange of the *Torrington* Spherical Roller Bearing provides *positive* roller guidance—the one best way to insure operating stability under radial and thrust loads.

Center guide flange surfaces and roller ends are ground to a common spherical radius. The asymmetrical roller seeks this flange under load, bearing lightly but constantly against it. Roller wobble and skewing are eliminated, and stress concentrations leading to early failure are avoided. Bearing operation is cooler, quieter and smoother.

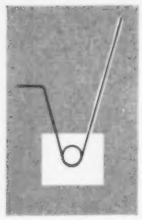
The integral guide flange is adapted from the same principle used in the design of Torrington Tapered Roller Bearings. It is an engineering refinement, based on experience in all types of applications, that insures outstanding performance in your equipment. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

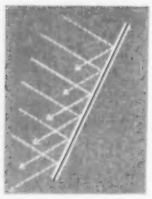
Every Basic Type of Anti-friction Bearing

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST

ARMCO
ALUMINIZED STEEL
TYPE 1



Sturdy steel coated with aluminum by a patented hot-dip process. No metal of comparable price can match ALUMINIZED STEEL Type 1 in resistance to destructive combinations of heat and corrosion.



The surface of this aluminum-coated steel reflects up to 80 per cent of radiant heat. It's used to "save" heat (hold it in) or to direct heat where it's wanted.

ALUMINIZED STEEL will withstand moderate forming, drawing or spinning operations without flaking or peeling

of the coating. Costs stay low because ALUMINIZED STEEL needs no further finishing after fabrication. Twenty years' experience by hundreds of manufacturers shows that products and parts made of ALUMINIZED STEEL mean service savings too—through longer life, more efficient operation.

For information about this aluminum-coated steel originated by Armco, write: Armco Steel Corporation, 2469 Curtis Street, Middletown, Ohio.

New steels are born at Armco

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Revolution in Marketing

One of the deeply significant but often overlooked changes in our economy is the revolution taking place in marketing.

In the immediate postwar years, consumers were starved for goods and would buy practically anything. Those times are gone forever.

Today's consumer is more sophisticated. Through promotion and advertising and shopping center displays, he has been taught to check for quality, utility, and price.

He no longer will settle for a 15 lb portable, tube-type radio when he can buy an 8 ounce transistorized model.

His tastes are changing too. An automobile no longer is a symbol of family prestige. It is simply a means of transportation. So, fewer dollars go for cars; more go for appliances, stereophonic record players, and home power tools.

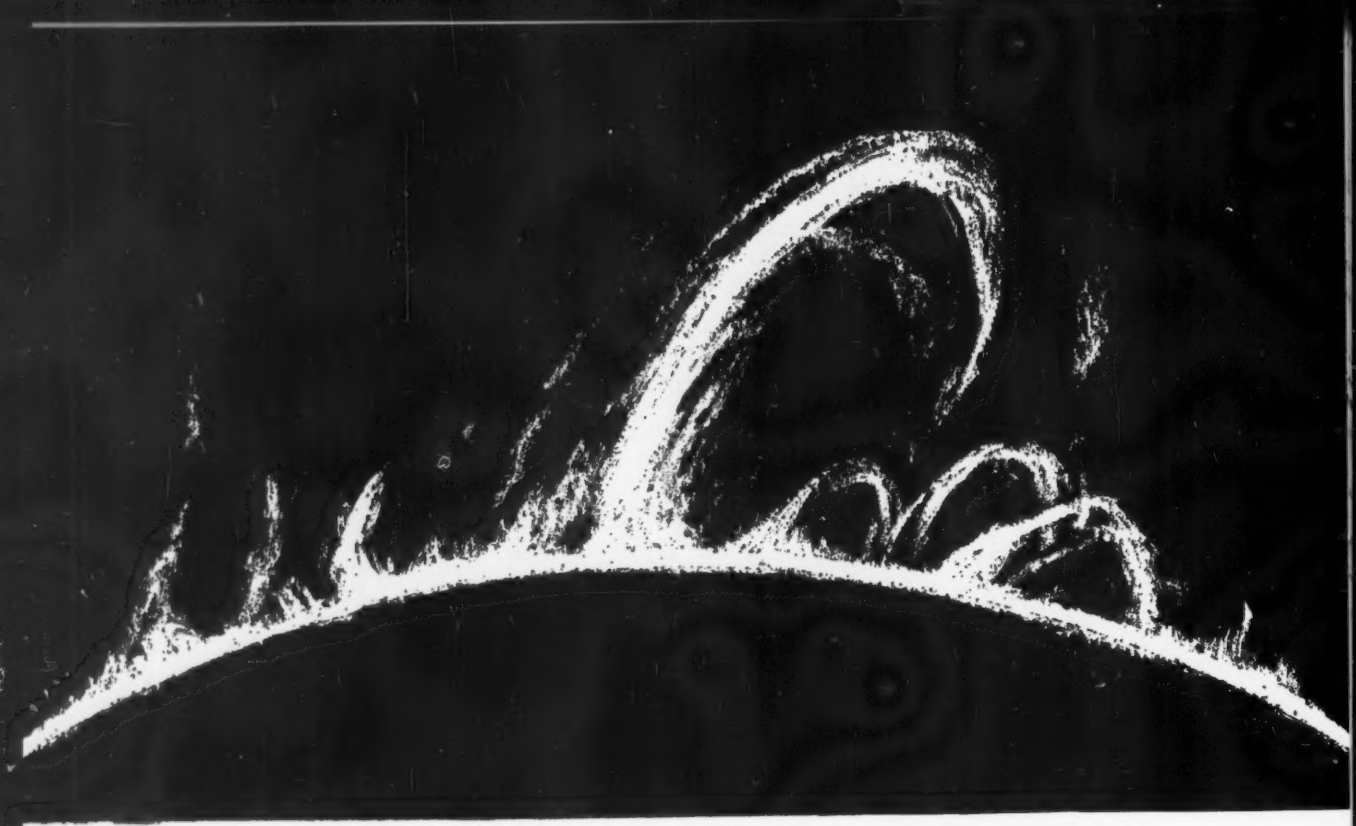
Industry too is contributing to the revolution in marketing through rapidly changing technology. Examples: Double pane window glass now available in smaller sizes may make extruded aluminum storm windows obsolete. Aluminum extrusions are expected to replace formed steel bumpers. Steel is replacing aluminum in supersonic airplanes. Alternators and semiconductors may replace direct current generators in automobiles.

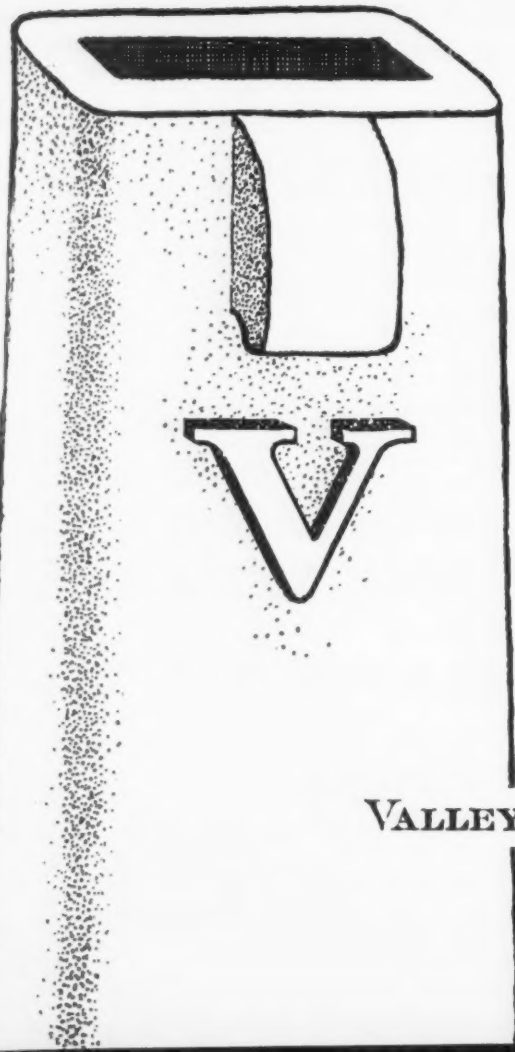
There is no foolproof approach to marketing. That holds true for two reasons: 1. You cannot always know what your competitor has up his sleeve. 2. You cannot always detect changing whims of consumers.

But, as STEEL's editors point out (Page 153), you can avoid many marketing pitfalls by co-ordinating at top management level all the elements that go into the production and sale of a product. Those include market research, product design, production methods, distribution, promotion and advertising, and economic forecasting.

Markets no longer can be taken for granted!

Irwin H. Such
EDITOR-IN-CHIEF





Tomorrow

we'll harness the energy of the sun . . . . .

but even then

steel will be poured into

VALLEY INGOT MOULDS

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

Progress Toward Steel Settlement?

SIGNS ARE increasing that the steel bargainers are at last on the track of a settlement.

• **Peace?**—Much of the evidence is tenuous, but convincing to labor observers:

1. The union's executive board met last Tuesday. The 33 members aren't called unless there's good reason, such as a briefing on new developments in the case.

2. New bargaining procedures started last Thursday whereby individual company and local union teams will meet, in addition to the top negotiators. One reason for the change may be to thrash out provisions on local working conditions. Industry has long wanted this and has indicated it would consider signing a two year contract granting insurance and pension benefits in the first year and a small wage boost in the second if the union granted some concessions in this area.

3. The two sides have stopped calling each other names and have toned down their newspaper advertising barrage.

• **Industry Position**—The steel industry's top negotiator, R. Conrad Cooper of U. S. Steel Corp., last week reiterated that any new contracts with the union must not increase labor costs. The companies' position, he said, "still is to prevent any increase in employment costs per unit of product."

Improvements in clauses covering local working conditions would permit some cost savings that could be passed along to workers. The companies also want stronger provisions against wildcat strikes, and they wish to drop the cost-of-living clause in the 1956 pact (but all the 17 cents an hour added to wage rates under the clause since 1956 would be retained).

• **Another Push Toward Peace?**—Still another factor that may be driving the parties to an early settlement: The government's hints that it will use the 80 day injunction procedure in Taft-Hartley if the strike isn't settled by early October.

The union wants no part of the injunction now, although it would have accepted it gladly in July or early August. The industry would accept T-H, but with no great enthusiasm.

• **Mitchell Makes Plans**—Washington rumors have it that Labor Secretary James Mitchell believes Oct. 1 should be the deadline for T-H. President Eisenhower will listen to his labor secretary's advice, but he will get other opinions.

His stern letter last week to both sides is interpreted to mean he's giving them a last chance to agree on a contract before he invokes T-H. He demanded uninterrupted bargaining, compromise, and a quick settlement.

• **Steel Supply Situation**—Steel shortages are troublesome now, will be serious by the end of the month, and dangerous to the economy if the walkout runs into October. (For a detailed look at automotive steel supplies, see Page 112.)

The strike has intensified the long range problem of foreign competition in steel and may result in permanent loss of some domestic markets to foreign producers, warns Charles M. White, chairman of Republic Steel Corp.

Imports in June hit a record 410,000 tons (see Page 234), and they probably were 430,000 in July.

Strike Losses

(Through Sept. 14)

Lost Steelworker Wages

. . . . . **$634,800,000**

Lost Sales

. . . . . **$1,848,000,000**

Lost Production **(Ingot tons)**

. . . . . **17,552,200**

Other Losses

Overhead, depreciation, and salaries of nonproduction workers in steel.

. . . . . **$352,000,000**

Tax Losses to U.S.

. . . . . **$405,000,000**

Where the USW's Money Goes

The steel union is rich and will remain so even with the expense of the long strike. Unlike the UAW, it pays no strike benefits but it does grant relief loans and gifts

SHED NO tears for the United Steelworkers. Individual members are feeling the pinch, but the union itself is not about to go broke.

While 500,000 members strike basic steel, the 500,000 still at work in metal fabricating and nonferrous industries are picking up the tab. Current monthly income is about $2.5 million (half goes to the international office, half to the locals) and that's more than enough to cover expenses.

• **Rich Get Richer** — Walter Reuther's gift of $1 million on behalf of the AFL-CIO's Industrial Unions Department was a grandstand play to demonstrate labor solidarity; the USW could get along nicely without it. Net worth of the international is about $33 million, and total resources (including buildings and treasuries of the 2900 locals) approach $70 million.

David J. McDonald and his cohorts started preparations for the 1959 contract struggle three years ago when they upped members' dues from $3 to $5 a month. At that time, the international's net worth was $21.4 million. Delegates to the eighth constitutional convention (San Francisco, Sept. 15-19, 1956) decided that a $50 million treasury was needed to give them a "true feeling of security."

• **Dues Hike Saves Day**—Although the dues increase brought strife to the union (culminating in Donald C. Rarick's unsuccessful bid for the presidency), it also brought money. And that turned out to be more important. The effect of the increase was to boost 1957 income by $13 million and 1958 income by $10.8 million. Net worth increased by $10.5 million during the two years (see graph).

If the dues hadn't been hiked, the USW would have lost $3.3 million in 1957 and $10.1 million in 1958, on the basis of expenditures for those years. Naturally, when dues paying membership fell from 1,080,000 to 848,000, efforts would have been made to live within the reduced income. But even if spending had been held at the 1956 level, net worth would have declined by $1 million during the period.

• **Union Cuts Payroll**—When the strike started, the USW stopped paying salaries to its male employees. But whatever it saved by that move was more than offset by the extraordinary expenses of contract negotiations—enormous bills for advertising, public relations, food, hotel accommodations, and transportation. At times, the union has as many as 700 people in New York.

The international isn't paying benefits to strikers, but it's render-

ing financial assistance ($500 to $1000 gifts or loans) to small locals. Women employees, numbering less than one-third of the staff's 1185 members, continue to draw full pay.

• **All-Out Fight**—"We don't talk about having a huge strike fund," a USW official declares, "but actually the entire treasury is behind us. The whole thing would be tossed in, if that's the kind of battle it was." It probably won't be necessary.

Leaders of the AFL-CIO seem determined to make their members finance the steelworkers' fight. They'll announce massive support —perhaps $25 million in loans and contributions—during their Los Angeles convention. But even if this money filters down to the people who really need it, it's only $50 per striker—less than half of a week's wages.

• **Where Money Goes**—Last year, the international spent $11.2 million. Major items: $2.45 million for salaries of international officers, departmental staff employees, and general office help; $1.8 million for payments to staff expansion trust fund, $958,000 for advertising (publicity, films, radio, television, and newspapers); $566,000 for travel expenses; $492,000 for insurance, $255,000 for actuarial services; $222,000 for convention expenses; $150,000 for Political Action Committee's education fund; $146,000 for legal fees; and $137,000 for legislative program. Fighting the "Right to Work" movement cost $100,000. The USW contributed $75,000 to United Organized Labor of Ohio, and $50,000 to the AFL-CIO's special anti-Right to Work fund ($25,000 was returned). District offices of the union spent $16.2 million last year.

Since the union doesn't establish budgets for any of its activities, there's almost no limit to what it can spend this year to win public support for its contract demands. The international lends interest-free money to other unions (woodworkers, telephone workers, electrical workers, autoworkers) and to its own locals so that they can erect union halls. It spends large sums on conciliation and arbitration of grievances.

United Steelworkers of America's Statement of International Office Expense

July 1 to Dec. 31, 1958

	No. of Persons	
Per capita tax paid to AFL-CIO and Canadian Labour Congress		$ 376,775.15
Negotiation wage scale, and other conferences		82,707.79
Boards of conciliation and arbitration		60,620.00
International officers' salaries	3	60,000.00
General office salaries	142	534,671.41
Departmental staff employees' salaries	140	679,012.95
Departmental staff expenses		376,020.58
Social security and other payroll taxes		29,082.12
Payments to staff pension trust fund		923,376.94
Local union supplies		108,382.68
Rent, light, and heat		89,160.89
Telephone and telegraph		46,250.20
Office supplies and expense		94,104.87
Organizing expense		11,490.15
Convention expense		222,210.32
Insurance		18,041.25
Staff health plan		13,896.40
"Steel Labor" publication		347,742.99
Travel expense		318,350.70
Subscriptions, publications, and pamphlets		70,523.46
Depreciation, real estate, and furniture and fixtures		63,205.61
Professional services		20,433.24
Actuarial services		130,308.12
International Metalworkers Federation		25,207.20
Political Action Committee, Education Fund		100,000.00
Public relations, charitable, and educational contributions		56,281.60
United Organized Labor of Ohio		37,500.00
Harry S. Truman Library Inc.		5,000.00
United Fund of Allegheny County		25,000.00
Baltimore Urban League		12,000.00
United Mine Workers of America—Nova Scotia disaster relief fund		5,000.00
AFL-CIO Special Anti-Right-to-Work Fund (Note A)		25,000.00*
Athletic programs		1,941.84
Legal fees		89,818.44
Bank charges, foreign exchange, etc.		41,051.84
Legislative program		110,786.42
Office improvements		65,518.96
Publicity—television, radio, newspapers, and films		666,188.64
Educational institutes and surveys		907.10*
Surety bonds		430.00
		$5,862,155.66

Note A: Refund of one-half of $50,000 contribution made in prior period.
*Deduction.

• **Investments**—As of July 31, the USW had 69.63 per cent of its portfolio in U. S. Treasury bonds ($16.6 million), 24.66 per cent in state and municipal bonds ($5.88 million), and 5.71 per cent in foreign government securities ($1.36 million). For the first seven months of 1959, average yield on original cost was 2.94 per cent. Although the union could get a larger return (appreciation) on industrials, it foregoes higher income in the interest of maximum safety and fast convertibility.

Holdings of common stocks are nominal (about $13,500). The USW owns one share in each of the companies it has organized so that it can be sure of getting an annual report.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service* STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Carbuilders may find steel for such parts as these zinc coated mufflers in short supply by the end of the month. GM appears to have the poorest prospects

Auto Steel Stocks Dwindle

SOME OF autodom's parts plants may be on short rations by the end of September. They'll be operating on a day to day basis as they scramble around in warehouses and other auto plants for steel. Assembly plants will keep operating through October although a few isolated facilities may be forced to reduce their present output schedules. But by the first week of November, lack of steel will start putting the squeeze on at least two thirds of the industry's 49 assembly plants.

• **Could Squeeze Buildup**—The possibility of reduced operations is particularly irksome to carbuilders who have scheduled October as the big buildup month. Some 640,000 cars are scheduled for completion during the month. That's more than double the 272,000 assemblies programed for September. The industry is figuring on double shift operations at 26 of its assembly plants.

To hit October's mark, General Motors Corp. will have to build 65,000 to 75,000 cars a week. That means they'll be using close to 100,000 tons of steel every six days. Ford will be building at a 35,000 per week rate and Chrysler will have to turn out 20,000 a week.

• **Goals Not Reached**—When stockpiling started, all the auto companies and their suppliers were aiming at 90 day inventories. As it turned out, few achieved that goal.

As far as can be determined, stockpiles ranged from 75 to 85 days when the mills finally shut down. Flat rolled inventories have been most adequate, but some of the specialty items, galvanized goods, and certain types of bar stock are tight. STEEL's sources indicate GM is in toughest shape. It lacks critical specialty steels for automatic transmission components. Many of its divisional parts plants are dickering with warehouses. One supplier reportedly is hard put to furnish enough wheels to enable two GM divisions to maintain full production through October.

Chrysler apparently is in good shape steelwise. It learned about shortages during the glass strike last year and has made it a point to lay in enough flat stock and bar steel to carry into November. Ford's own steel mill is operating, taking much of the pressure off that automaker. Ford should be able to build well into November before lack of supplies forces cutting of assembly schedules. American Motors is safe through November. Studebaker-Packard can go on a one-shift basis until Dec. 1.

• **Juggling Begun**—As 1960 model buildups get underway, it's evident the juggling has started. Detroit's full of talk about car divisions shifting dies from one supplier to another to insure enough parts to keep going. Venders are being told that they must confirm December steel deliveries even if it means buying through warehouses. Some of the maverick warehouses who were doing rush business with low price foreign steel a month ago have upped their prices to compete with domestic steels. All warehouses are booming. Flat rolled is hard to come by and the daisy chains that are running full tilt indicate cold rolled sheets are bringing up to $20 a ton out of Chicago houses.

Detroit has figured on a 1.9 million car buildup for the final quarter of the year. It probably can get out 1.25 million without much

strain, but the last 600,000 or 700,000 units may be rough going. Even after the strike is over, there will still be some delay before shipments start moving out of the mills.

• **Autodom's Problem** — Should it build out fast and take a chance that the strike will be settled or should it reduce November schedules and limp along through the Christmas season? How well 1960 models sell will affect the decision.

Lone Star to Operate; Cyclops' Output Resumed

Employees of Lone Star Steel Co., Dallas (annual ingot capacity: 800,000 tons), are working without a contract while negotiations between the company and union continue. Their contract expired Sept. 7. If a strike is called, Lone Star will be given a 36 hour notice before the picket lines go up. But even if this occurs, the firm will operate. About 1500 workers, over half of the bargaining unit, are expected to stay on the job. As in the past, the company has set up sleeping, eating, and recreation facilities within the plant so working employees will not have to cross the picket line.

The Bridgeville, Pa., plant (annual ingot capacity: 77,410 tons) and the Titusville, Pa., fabricating facility of Universal-Cyclops Steel Corp. have resumed operations under a contract extension agreement. Thus ends an eight week strike begun July 15 when United Steelworkers idled other steel plants across the country. Both plants are organized by USW Local 178.

Aussie-Red Trade Booms

Australia is finding a growing market for steel products in China and other Communist countries. Steel exports to China, mostly general industrial goods (such as piping, sheets, and rods) reached a record $14 million last year, nearly half the total trade with that country. Authorities expect the figure to top $16 million in 1960.

Soviet officials have expressed a keen interest in Australian finished steel products and raw materials. The appointment of a commercial counselor to the new Russian embassy in Canberra is expected shortly.

By a tacit reversal of an earlier policy, the government has taken the view that no purpose of international policy can be served by withholding goods from Communist nations that could be freely purchased from other parts of the western world.

Australian steelmakers now claim their product is the cheapest in the world and equal to the best produced in the U. S.

Reds Buy U.S. Plant

Plastic pipe facility will be shipped to Russia. Government approves $1 million deal

AN AMERICAN made plant for the production of plastic pipe has been sold to the USSR by Omni Products Corp., New York. It is the first purchase of such equipment by the Soviets from the U. S. The pipe will be used for irrigation purposes.

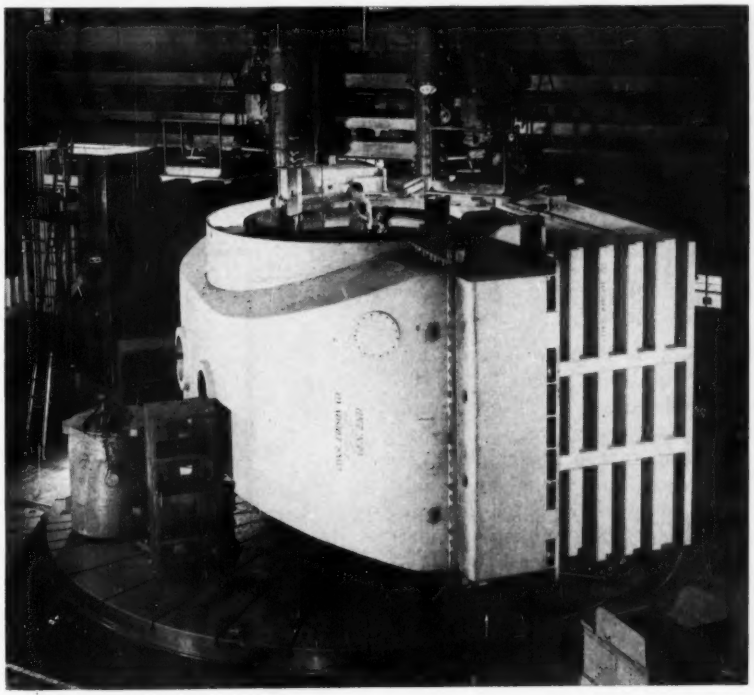
The New York exporting firm says the deal has full approval of the Department of Commerce. The contract covers purchase of a complete plant, including extruders, grinders, and dies. The facility, comparable to a large U. S. plastic pipe operation, is capable of turning out 10,000 tons of pipe annually, valued at $10 million to $12 million a year.

The equipment components are to be obtained from various U. S. companies. Delivery will begin this year and should be completed by early 1960. Price, while not disclosed, was reportedly over $1 million.

Payment will be cash in U. S. dollars.

Omni was contacted by Russian representatives late last year during an international plastics exhibition in Chicago. They were touring the country as part of a U. S.-Soviet industrial exchange program.

The Russians will provide their own raw materials (polyethylene and polyvinyl chloride) in making the pipe.



GIANT SECTION OF A STEAM TURBINE (low pressure type) is being machined on a 40 ft mill at Allis-Chalmers Mfg. Co., Milwaukee. It's part of a 340,000 kw generator unit: A cross compound, close coupled machine with high and intermediate pressure turbines on a 3600 rpm shaft and two low pressure turbines on an 1800 rpm shaft. It will be installed at Astoria Station, Consolidated Edison Co., New York

Leasing: Valuable Marketing Tool

Leasing attacks the three factors of sales resistance:

1. **New equipment too expensive.**
2. **Old machinery can still produce.**
3. **Tight capital situation.**

By offering:

1. **Minimum capital investment.**
2. **Immediate use of equipment.**
3. **Cash flow advantages.**
4. **Tax deferral advantages.**

"PROFITS are created through use —not ownership—of assets." That's the reason for leasing's rapid growth, says U. S. Leasing Co., San Francisco. Early this year, Nationwide Leasing Co., Chicago, estimated the value of leased capital equipment would reach $300 million in 1959. But a re-evaluation leads the firm to believe that figure is much too low. Of the $227 million worth of equipment leased in 1958, professional lessors handled $200 million compared with $1.5 million in 1953, reports U. S. Leasing.

• **Leasing Is Popular**—Leasing attacks the three main factors of sales resistance: 1. "New equipment is too expensive." 2. "Our old machinery can still produce." 3. "We have a tight capital situation." It does so by offering immediate use of equipment with minimum capital investment. Other benefits: Cash flow and tax deferral advantages. Nationwide's president, Robert Sheridan, says: "A sales vice president who isn't using and promoting leasing is reducing his sales potential 10 to 20 per cent."

"If a customer needs new equipment, he has no excuse for not getting it from us, now that we have leasing in our marketing program," states Kearney & Trecker Corp., Milwaukee. "He can pay cash, buy on conditional sale, or lease."

"Leasing is a great inquiry puller and gives us a tremendous competitive advantage over firms not offering such programs," adds an eastern manufacturer.

• **Because It Helps Sales** — Anything that's not expendable is leased. York Corp., a division of Borg-Warner Corp., York, Pa., launched a leasing program for its commercial air conditioning equipment in the middle of the recession. Sales jumped 16 per cent last year compared with an industry drop of 10 per cent. A $295,000 analog computer, manufactured by Computers Systems Inc., New York, was leased to Humble Oil Co., Houston. Without such a program, the sale could not have been made. The St. Paul Union Station, owned by eight railroads, negotiated a lease for an automatic mail sorting system, manufactured by Stewart-Warner Corp., Chicago, and valued at close to $1 million. Under multiple ownership, it was the simplest method of obtaining the equipment.

Your customers will like leasing because it preserves their working capital and bank credit while returning a profit. Other advantages: Hedge against obsolescence, financing without dilution of ownership or control, and tax deferral and other long term advantages. Although on paper leasing may appear costlier than purchasing, it

Here Are Two Five Year Plans

Time Purchase	% of Original Value
Down payment	**25%**
Amount to finance	**75%**
Finance charges	**22½%**
(6% add on = 30% of 75% = 22½% of 100%)	
Total payments	**97½%**
less down payment	
Total cost	**122½%**
(Ownership: Full)	

may be cheaper in the long run due to its cash flow advantages.

• **But It's Not All Roses**—However, leasing is not a free wheeling road to increased sales and joyous customers. Purchase options are frequently an invitation to waltz with the Internal Revenue Service. Reason: Option to buy clauses are often considered conditional sale contracts by the government men, wiping out the tax deferment and other benefits. Difficulty: Tax law interpretation varies from area to area. As a result, purchase options are frequently discouraged. A midwest machine toolmaker is currently entangled with tax officials and unhappy customers because of this pitfall.

Fixed payments in a period of declining profits may be burdensome to lessees. Credits and collections are a problem to lessors on occasion if extensive credit investigation of customers is not fulfilled. New depreciation laws allowing faster writeoff have eliminated some advantages, comments a New England manufacturer.

Another drawback: Leasing requires the lessor to assume great risk and tie up a lot of capital.

• **Some Lease Through Pros** — To avoid such a drawback, many firms work through professional leasing firms. They often offer sales assistance and merchandising aids for your sales organization. The leasing company buys the equipment from you, finds a refinancing source to which your customer's credit is satisfactory, and negotiates the lease, setting up a program specifically adapted to the customer's requirements. Result: You get cash immediately, the customer gets his equipment, and the lessor handles the paperwork.

Advantages to using a leasing company: 1. You don't need to play banker, tying up needed capital. 2. The professional has know-how with tax authorities. 3. He's got leasing knowhow. 4. There's no sales staff pressure to ignore good leasing practices.

Not all lessors are properly financed or managed, warn finance authorities. Don't deal with a company that won't divulge its income source or method of operation.

• **Some Handle Their Own**—Many firms prefer to do their own leasing. Jones & Lamson Machine Co., Springfield, Vt., feels direct leasing has a psychological advantage—a closer bond with the customer which is of great value. Elwell-Parker Electric Co., Cleveland, sees leasing as a moneymaker in itself.

Two points should be considered before launching into this area: 1. Sound forecasting of cash requirements (some say they always seem to grow). 2. Proper checking of the tax situation since leased equipment still belongs to you.

Frank K. Griesinger, assistant treasurer, Lincoln Electric Co., Cleveland, is a nationally recognized financing authority. He says the product leased should be costly enough to warrant pay-as-you-go financing.

On the other hand, with smaller items, several can be leased in the same contract to reach a sensible minimum total value, suggests Boothe Leasing Co., San Francisco.

• **Others Do Both** — Towmotor Corp., Cleveland, at times chooses the direct route; at other times it deals through a professional. Reason: Some leasing companies will frequently assume only prime risks. Direct leasing broadens Towmotor's potential market by enabling the firm to lease to small firms and new companies.

• **Principal Methods**—Most major equipment leases run five to seven years, although the extremes are two to 15 years. Payments are monthly, quarterly, semiannually, or annually on a straight line, staggered, or sum-of-the-digits basis. At the end of the period, the customer can renew on a yearly basis. Purchase options, as mentioned before, are sometimes available.

The lessee is responsible for maintenance. Customer satisfaction is the manufacturer's responsibility. When leasing firms are used, they act chiefly as money handler and risk bearer.

• **Outlook**—Most firms interviewed by STEEL, say leasing is presently a small but important part of their sales programs. But the consensus is that it will continue to make large gains. One enthusiast claims: "Sooner or later it will be unusual for a firm to own its own equipment."

For further information, you might want to consult *Sale-Leasebacks and Leasing in Real Estate Transactions and Equipment Transactions*, by Frank K. Griesinger and Harvey Greenfield, published by McGraw-Hill Book Co., New York. It's an excellent reference book.

to Lease or Buy That Machine

Lease	% of Original Value
Security deposit	**10%**
(returnable)	
Leasing charges	**18% per year**
Total cost	**90%**
(Ownership: None)	
Payment after five years if option to buy is exercised . . .	**40%**
Total cost	**130%**
(Ownership: Full)	

Top Ideas Win $13 Million

Big winners last year included two U. S. Steel blast furnace workers, a wind tunnel model builder for an aircraft company. Cash awards are being raised; Sylvania will pay $25,000 for the best idea submitted

THE 238 member companies of the National Association of Suggestion Systems paid employees more than $13 million for usable ideas last year. The harvest: 427,117 usable suggestions from more than 1.6 million entries.

The highest single award reported, $32,000, went to two blast furnace workers at the Gary Works of U. S. Steel Corp. Their idea: An improved way to recover molten iron from slag.

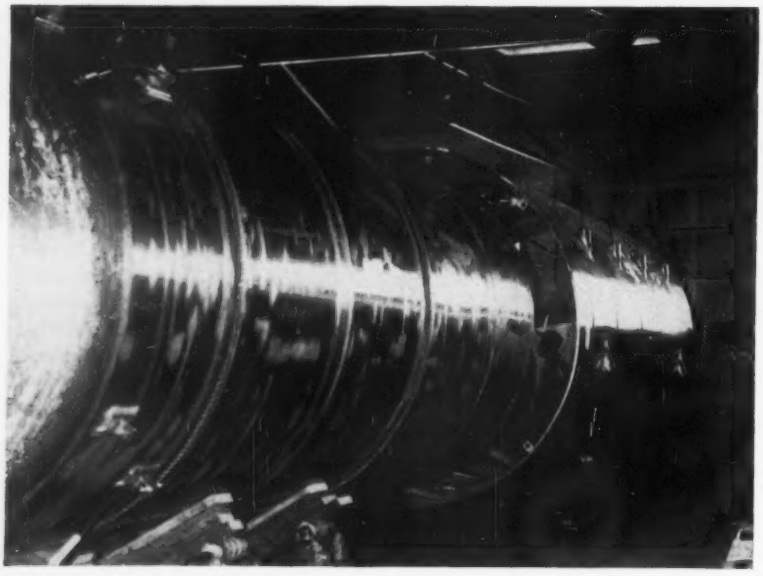
• **Outstanding Ideas**—North American Aviation Inc. paid $1000 to one of its wind tunnel model builders. His suggestion: The use of model wing skins for various wind tunnel tests. A $2000 reward was paid by Phillips Petroleum Co. for a way to reduce the operating costs of an HF acid alkylation unit. Remington Rand Div., Sperry Rand Corp., paid its highest award, $3492, for a product improvement idea on its file computer equipment.

Millions of dollars have been paid out in some long standing programs. General Motors Corp. has received more than two million suggestions in the last 17 years. More than one-half million ideas have been accepted and have earned $28 million. Standard Oil Co. (New Jersey) has paid $3 million for more than 104,000 usable ideas.

NASS reports that some companies are liberalizing cash awards to spur participation. Sylvania Electric Products Inc. has raised its top award to $25,000.

Organizes Warehouse

Youngstown Steel Warehouse Co. has been organized as a subsidiary of Youngstown Steel Tank Co., Youngstown. It will stock and distribute steel plates, structurals, sheets, and specialties. William F. O'Loughlin is general manager.



LIQUID OXYGEN CARRIER, shown during fabrication by Beech Aircraft Corp., Wichita, Kans., is constructed from aluminum alloy 5083, developed by Kaiser Aluminum & Chemical Corp., Oakland, Calif. The container assembly, called a Dewar, consists of two concentric tanks separated by a 6 in. vacuum space filled with an insulating material

NEW PLANTS

Continental Can Co., New York, will build a 250,000 sq ft can plant and warehouse at Shoreham, Mich., a suburb of St. Joseph. Initial capacity will be 250 million cans a year on a two shift basis. The plant has been designed for expansion to nearly double capacity and also the addition of lacquer coating and end fabricating equipment.

Peninsular Steel Co. has formally opened its warehouse at 26800 Richmond Rd., Bedford Heights, Ohio.

R. C. Mahon Co., Detroit, is building a $3.5 million plant at Torrance, Calif. The West Coast facility will consist of a 200,000 sq ft manufacturing building and a 10,000 sq ft administrative-engineering building. Manufacturing operations are scheduled to start by Dec. 1.

Construction of a new office and warehouse in Crocker Industrial Park, San Francisco, is underway for the **Stanley Works,** New Britain, Conn. The building will contain 45,000 sq ft with 4000 sq ft of office space.

Controls Co. of America, Schiller Park, Ill., leased a plant at Winamac, Ind., and has spent $135,000 to equip it. The company also has an option on a 10,400 sq ft building in that city. The facility will do assemblywork for the firm's North Manchester, Ind., plant where timers for home laundry appliances are manufactured.

Vulcanium Corp., recently formed to manufacture titanium assemblies and corrosion resistant equipment for metal finishing and industrial applications, opened a factory at 3080 Skokie Valley Highway, Highland Park, Ill. James K. Trinz is president.

Metalworking's Research and Development Budgets--1959

(Selected industries)

Industry Group	Number of Companies Reporting Total	Up	Same	Down	Average 1959 Increase Over 1958	1958 Budget As % of Sales
Agricultural Mach.	4	4	—	—	8.8	2.6
Aircraft	12	7	2	3	6.7	3.3
Automobiles	5	5	—	—	32.1	2.8
Electrical Mach.	40	27	3	10	23.8	4.1
Engines, Turbines	5	3	—	2	2.8	2.0
Fab. Metal Products	33	19	5	14	5.7	1.7
Industrial Mach.	19	15	2	2	16.3	7.0
Instruments	42	25	3	14	29.7	4.8
Metalworking Mach.	3	2	—	1	21.7	3.2
Misc. Mach., Parts	9	3	3	3	(−2.5)	3.1
Misc. Manufacturing	63	44	6	18	9.6	2.8
Nonferrous Metals	21	11	2	8	12.4	1.3
Office Machinery	9	8	1	—	13.0	3.0
Petroleum Refining	19	12	5	2	1.4	1.2
Service Mach.	1	1	—	—	6.0	1.9
Steel	12	5	1	6	2.4	1.1
Transportation Equip.	4	2	—	2	7.5	2.2
Total/Average	311	193	33	85	11.6	2.8

Source: American Management Association.

R&D Program Outlays Rise

American Management Association surveyed nearly 600 U.S. corporations to learn research and development budget allocations in 1959. The outlook: About 64 per cent will boost spending about 12 per cent over 1958

RESEARCH and development budgets in nearly 600 U. S. corporations are averaging more than 12 per cent higher this year than 1958's record outlay, reports the American Management Association.

A total of 64 per cent of companies studied increased their budgets for the development of new products and processes, 8 per cent were unchanged, and 28 per cent reduced scheduled outlays. Dr. Philip Marvin, the AMA's research and development division manager, said that last year's R&D budgets were only 4 per cent higher than those of 1957.

• **Autos Up**—The automobile industry will make the biggest research budget increase, 32 per cent above last year's program. Other industries making major hikes are makers of electrical machinery, up 23.8 per cent; instruments, up 29.7 per cent, and metalworking machinery, up 21.7 per cent.

New product expenditures in 1958 averaged 3.2 per cent of the sales dollar vs. an average of 2.8 per cent in 1957, says Dr. Marvin. He told a meeting of corporation presidents: "The really big achievements will depend more on technological capabilities and the use of technology than on the mere spending of more money. The expenditure of less money can often yield greater returns, if spent wisely and effectively."

STEEL's analysis (left) shows comparable figures for the metalworking industries surveyed by the AMA.

Magnesium Output Begun

A competitive magnesium producing industry got underway in the U. S. last week with the successful production of magnesium at Alabama Metallurgical Corp.'s new $3.5 million plant at Selma, Ala. The only other private producer of magnesium in this country is Dow Chemical Co., with two plants in Texas.

The first production came from test charges in two of ten furnaces to be activated. Formal opening of the plant is scheduled for Nov. 11 when the company expects to attain full production.

Alamet is owned by Calumet & Hecla Inc., Chicago, and Brooks & Perkins Inc., Detroit.

Research Center to Open

A $2 million research center will be dedicated Sept. 18 at North Wales, Pa., by Leeds & Northrup Co. The firm makes electronic measuring and control devices and heat treating furnaces.

Ventilating Firm Opens

Structa-Lung Co., Willoughby, Ohio, has been formed to manufacture industrial power roof ventilators, fans, and ventilating systems. Morton Simon is president.

The labor reform bill sent to the White House is a compromise between measures sponsored by Senators Kennedy and Ervin (above) and Representatives Landrum and Griffin (below)

New Grit in Taft-Hartley

TAKE YOUR pick of comments about the new labor reform bill.

It is "vastly superior" to the Kennedy-Ervin bill passed earlier this year by the Senate.—Sen. Barry Goldwater (R., Ariz.)

It is "the best bill we can get and still get a bill."—Sen. John F. Kennedy (D., Mass.)

It is the "type the President has long requested."—Secretary of Labor James P. Mitchell.

"The actual meaning of all this language will not be determined for years."—International Association of Machinists.

It is antiunion.—Sen. Wayne Morse (D., Oreg.)

It "makes Taft-Hartley worse."—AFL-CIO.

A fair summary is made by Sen. Thomas J. Dodd (D., Conn.): "We must keep our eye on the operation of this bill. If it contains loopholes which permit the continuance of labor racketeering, they must be closed. If it contains provisions that bear down unjustly upon clean unionism and hinder its legitimate attempts to organize new workers and improve working conditions, those provisions must be removed."

AFL-CIO has flatly stated its recruiting activities in the South and among whitecollar workers will be retarded. As the bill went to the President, it is a compromise between the Griffin-Landrum measure passed by the House, and the Kennedy-Ervin measure passed by the Senate.

Changes in Act Are Important

Four issues are most basic to the bill's possible influence on labor-management relations in the years to come. They are amendments to the Taft-Hartley Act.

The Kennedy-Landrum Bill follows the President's recommendation that state labor agencies and courts can take jurisdiction over labor disputes not handled by the National Labor Relations Board.

A secondary boycott is termed an unfair labor practice under the Taft-Hartley Act. The new bill makes it illegal for a union to induce supervisors to stop work (supervisors are not employees under this section of T-H); or to coerce or threaten (but not ask or persuade) an employer to stop doing business with another firm already struck.

"Hot cargo" contracts between unions and employers, under which employees may not be required to handle the goods of a struck plant, are outlawed by the new bill, except garmentmakers' subcontracts and construction firms' subcontracting at joint construction sites.

"Blackmail" picketing is prohibited to this extent: 1. If another union has won an NLRB election or the employer has voluntarily recognized another union. 2. If there has been an NLRB election within the previous 12 months.

Members' Rights Are Established

Several features of the new bill guarantee the rights of union members to democratic union leadership. Secret ballots, written charges when a member is to be disciplined, and the right to sue if his rights are violated, are included. Unions are required to file reports on their activities with the Department of Labor, including constitutions, statements of assets, liabilities, and loans to members. Elections of union leaders will be more democratic in several ways: National officers must be elected by secret ballot at least every five years, local officers every three years. Candidates will be able to mail promotion literature to the membership and will be able to inspect the membership roster in union shops.

Finally, the secretary of labor has the power to investigate and subpoena witnesses, if he suspects any violation of the member's rights.

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Any time you face the problem of reducing cylinder cup breakaway or sliding friction, chattering or freezing, come see us. We're reasonably certain that Chicago Rawhide's Sirvis Leather K-400 cups can help you. Their specialty is easy sliding — particularly in vacuum cylinders at sub-zero temperatures and in pneumatic cylinders at ambient temperatures and low pressures. Tests show a 50% reduction in breakaway and sliding friction over standard leather cups at ambient temperatures . . . and these K-400 cups are functioning beautifully in applications at -30° F. In another test, C/R Sirvis K-400 cups were run well over one million cycles at 20" of vacuum with negligible leakage and wear.

So if you are trying to design a new, smooth-working, low-friction pneumatic cylinder — or take the bugs out of an old one — jot down C/R K-400 cups and call us.

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Ravioli is destined for even greater popularity . . . thanks to this unique "mechanical chef".

With it, volume production is possible—quality can be easily maintained. The operator simply fills the hoppers—the "chef" automatically rolls the dough, inserts the stuffing, shapes and cuts the ravioli...at *18,000* pieces per hour. Dough thickness and stuffing quantity can be precisely controlled for uniform taste and peak flavor.

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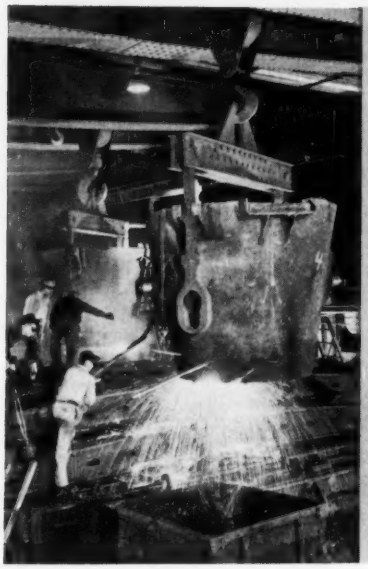
THE CAPITAL SPENDING **BOOM** BEGINS

How Foundry Equipment Sales Will Climb



(Second half, 1959, vs. first)

Sand preparation equipment	Up 15%
Coremaking & core blowing machines	Up 59%
Molding machines	Up 20%
Casting machinery	No change
Dust collecting & ventilating systems	Up 25%
Shakeout machinery	Up 5%

BETTER THAN DOUBLE. That's how 1959 orders for foundry equipment will compare with 1958's.

It means a record year for equipment makers. They picked up orders for about $73 million worth of equipment in the first half; second half orders will edge toward the $90 million mark—putting 1959 volume near the $160 million level vs. about $75 million last year.

Another record is just around the corner. Most equipment makers expect their 1960 incoming orders to be 10 to 20 per cent greater than this year's. They say that the "wait and see" attitude among founders early this year has turned into "let's get ready for the sixties."

• **Prices** — Some makers of sand preparation equipment, molding machines, and coremaking machines hiked prices this spring and summer. Several producers of dust collecting and ventilating equipment are considering increases this fall. Two told STEEL they're sure of such action. Amount: 5 to 8 per cent.

You can expect other scattered increases in the next six months. Examples: A maker of vibrators will boost its charges 10 per cent; a coremaking machine producer will lift its charges 10 per cent on Nov. 1; a manufacturer of core blowing machines will jump quotations 8 per cent this month.

Price fighting has subsided since the recession. Most manufacturers say it's still "brisk" but no longer "serious." Exception: A price war still rages among producers of dust collecting and ventilating equipment. All but one of the companies that STEEL contacted say the situation is "serious." And most expect no change in the coming six months. They report underbidding ranges from 5 to 40 per cent. One producer tells of bidding slightly over $20,000 on a job which was taken by a competitor for a little more than $16,000. "And we used a sharp pencil," moans the unsuccessful bidder.

But such bargains aren't common in other types of foundry equipment. And most producers expect such cases to become more infrequent.

• **Foreign Competition** — STEEL asked leading equipment makers to classify the severity of foreign competition in several lines of foundry equipment. The consensus: "Practically nonexistent" in shell molding machines; "mild" in casting machinery, sand preparation equipment, and core blowing machines; "brisk" in vibrators and shakeout machinery; "serious" in dust collecting and ventilating systems.

Nearly all expect the foreign threat to become more severe. A major producer of casting machinery says it has already reached critical proportions in export markets and that his firm has been underpriced by 40 per cent on European jobs.

One area that foreign firms are beginning to concentrate on is shakeout machinery.

STEEL learned of one situation where a foreign firm got the contract by undercutting domestic prices 30 per cent.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, Penton Bldg., Cleveland 13, Ohio.

"...so after I discovered he was afraid of making a mistake, I used a different pitch . . . and nailed down the order!"

This salesman is prospering. So is his company. Both uncovered an exciting fact, long suspected and now proved: there is no such thing as a cold, rational, *industrial* buyer who buys solely on *merit*. He's a *human being* who buys on *emotions* as well as reason! STEEL's new depth study of *why* metalworking managers buy reveals an amazing variety of emotional factors underlying industrial purchases. Imagine how these data can open new, rewarding avenues for more effective advertising and selling! To the best of our knowledge, this is the first study of its kind in industry. It is another example of STEEL's leadership in serving metalworking marketers. For complete details on how you can *apply* these findings to improve sales and advertising direction, drop us a line . . . or get in touch with your STEEL representative. **STEEL Magazine, Cleveland 13, Ohio.**

Employee Meetings Pay Dividends

Whether you want to get together with small groups of production workers, supervisory personnel, or the entire work force, such meetings provide one of the best means of communicating up and down the line. Here's how to get the most out of these sessions, with tips on handling ticklish group situations. The results of a good job can show up in the financial statement

ARE YOU getting full value from employee meetings?

Some managers persist in running them the Army way. (Do something, even though it's wrong.) They aren't having much luck.

Productive meetings follow this blueprint: Today's employee does his best work when he knows the "Whats" and "Whys" about his company's operations, its economics, and its business outlook.

Not only that. He rates the well planned, well executed meeting above all other methods of getting such information, reports Opinion Research Corp., Princeton, N. J. Its findings are being confirmed by more and more companies. Here's a lot of the knowhow they've gained.

• The best meetings are called for a specific reason.

Experienced conference leaders caution against holding meetings without a specific subject to explore or a current problem to solve. Above all, the kind of meeting you need will depend on the atmosphere and the needs of your company.

• In general, three different types of meetings are used:

1. Supervisor-employee meetings. Here is where upper management can take a direct hand in the development of key supervisory personnel, and supervisors, in turn, can get close to the worker.

The typical session opens with a few remarks by the supervisor which deal with the operation of his work unit, but they are tied in with the functioning of the company as a whole. Then he steers the discussion, encouraging employee initiative in reviewing and analyzing problems being aired and stimulating a constructive exchange of opinion.

Meetings for supervisors alone deal with specific problems of management, where the thinking and experience of the group can be brought to bear on trouble areas.

2. Departmental meetings. In this instance, a series of meetings is useful. Each is addressed by a company officer or specialist in some phase of the firm's operation. The formal presentation can be followed by discussion. The group is broken down into smaller units for the purpose of talking over the information that was presented.

3. Company-wide meetings. Although the mass meeting doesn't offer the informal, two way exchange found in smaller groups, it can be more dramatic and promote a feeling of unity among employees. The employees like them because the information comes right from the front office, and they are able to "meet with" the boss.

Some companies call them as often as once a month. Others, like the Terrell Machine Co., Charlotte, N. C., have them once a year, at the time of the annual report, and any other time management feels

The Conference

Problem Personalities

Know-it-all

Argumentative

Injured dignity

Overtalkative

Shy

Obstinate

Disinterested

Man with a grudge

a meeting is necessary. For example, midway through one fiscal year, Terrell management was disturbed about its financial position and called a mass meeting to explain the problem. Terrell reports: "We were met with a spirit of cooperation." The company managed to exceed its goals by yearend.

• Leadership is the touchstone.

The conference leader must be capable of handling the meeting and himself through thick and thin. He must be resourceful in handling people (see exhibit).

U. S. Rubber Co. defines a good leader in its conference leader's guide. First of all, he must believe in the value of the meeting, realizing that he is doing a job with the subject matter and also taking a part in the development of each person present.

In conducting the meeting, the leader faces these obligations: 1. To be himself, rather than try to imitate the boss. 2. To aim high by insisting on useful thought and action. 3. To keep faith with the group by respecting all thinking. 4. To give his best by subordinating his personal feelings and prejudices.

As a discussion leader, he must outline the subject matter in terms of what the group can offer, from their experience and interest, and what they can or need to do about it. His tools are a complete outline of the subject's important points and carefully framed questions which will draw out personal thinking and discussion. His objectives are to stimulate the widest possible participation and to keep the discussion on the track.

• Thorough planning and follow-through will determine your success.

A wealth of company experience indicates some ground rules. Be sure to announce meeting times well in advance and see that all interested parties are included. Make the atmosphere of the meeting as informal as possible; arrange for smoking privileges, if possible, and provide comfortable, but not sleep-inducing, seating. (For small groups, round table seating gets everyone into the act.) Meetings should be on company time and last 1 to 2 hours.

Finally, let the employees know the results. Minutes or resumes should be posted or otherwise disseminated. If a management decision or action results from the meeting, employees will appreciate knowing the part they played. Every effort should be made to show the employee that management is attempting to get constructive co-operation and intends to make use of his views.

One direct approach you can take to improve the content of your meetings is to survey the reaction of those who have participated. After the meeting, have every participant fill out an evaluation form covering the conduct and results of the meeting. Another approach is to make an opinion survey on the subject matter presented, including the thinking of those who sat in on the meeting and those who did not. The difference in attitudes can tell you a great deal.

• This is the last of a three part series on how to deal with employees. How to keep supervisors happy was explained in the Aug. 31 issue. On Sept. 7 communication problems in employee relations were covered. An extra copy of any of these articles is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Leader's Dilemma

How to Handle Them

_____ Encourage others to comment freely on his remarks; let the group take care of him. Build up the confidence of others to defend their views.

_____ Keep cool; draw out the individual and turn him over to the group. Keep members from getting personal; stress majority opinions.

_____ He feels you are telling him how to do his job; get him to feel his experience can be valuable to others and that the exchange of ideas is important.

_____ Be tactful but interrupt and ask others for their comments. Pass the question around the group, but don't lose his support.

_____ Call on him by name for an opinion, but ask an easy question he is sure to answer well. Give him something to do or a report to present.

_____ In a tactful way, bring discussion to a close by calling for a vote on the question. Determine the individual's likes and dislikes; win his friendship.

_____ Ask direct questions affecting his work. Pick out something in his department to praise as a good example; determine his likes and interests.

_____ Announce that no personal gripes will be discussed; avoid his pet peeves. If his enemy is present, prevent discussion between them and reschedule one for a different meeting group.

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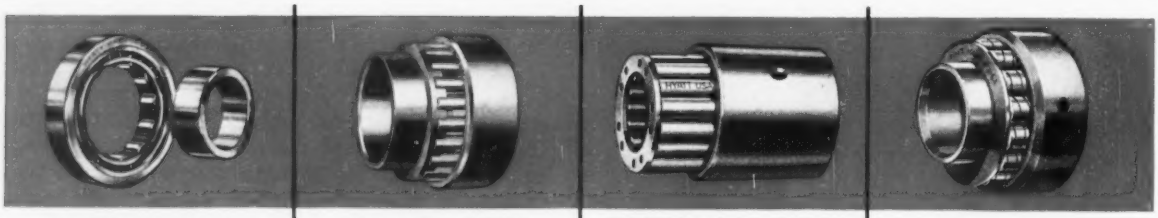
Whatever your roller bearing problem, you'll find a type to solve it in America's most complete line of cylindrical bearings—HYATT Hy-Rolls! Their greater load capacity is particularly helpful when heavy loads must be carried in cramped quarters. To save space, inner or outer races can be omitted from separable types. Shouldered-race types will also take thrust and locate heavy shafts dependably. You can *depend* on the advice of your HYATT Sales Engineer—and the bearings he recommends! Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.



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A three-part separable bearing which provides maximum resistance to shock, abrasion and fatigue.

For Speeds up to 60,000 RPM—HYATTS are designed to meet almost any speed requirement, ranging from slow-moving construction equipment to supersonic jet engines.

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In Sizes from ¾" OD to 14' OD—HYATT offers a wide variety of bearing types and sizes—each quality-designed and quality-controlled to provide longer life.

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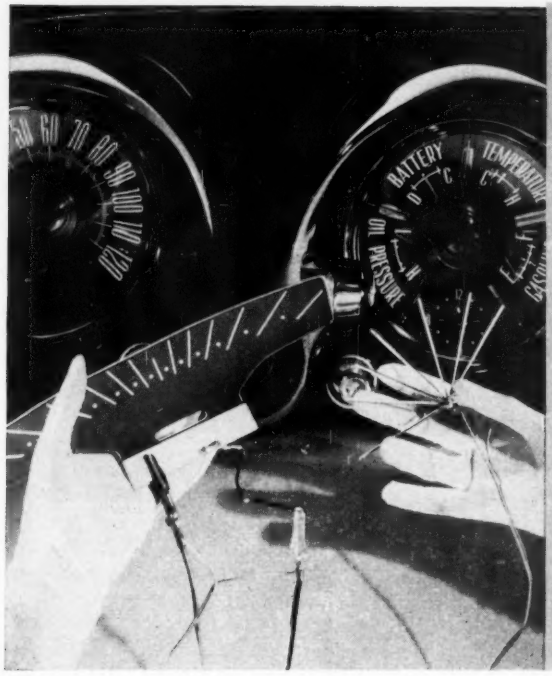
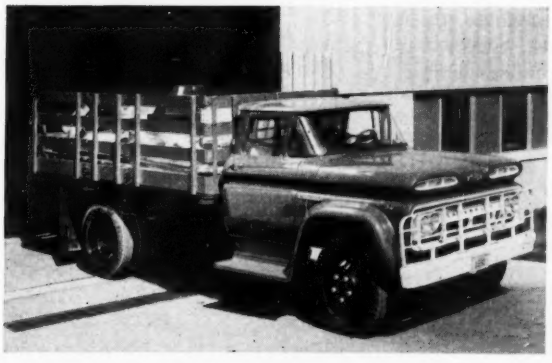


CHRYSLER CORP. is introducing electroluminescent (EL) lights on its top lines as predicted in STEEL (June 22, p. 56). Glare in this Imperial instrument panel will be reduced drastically without lowering readability. Developed by Sylvania Electric Products Inc., Panelescent lamps are made by coating thin metal shapes with several ceramic layers including glass based, conductor materials and electroluminescent phosphors, sealed in transparent glass. Total thickness of all layers is less than 1/50 in. Treated metal is wired conventionally and connected to an alternating current power source.

The blue-green lamps cost no more than today's incandescent lights and never burn out; they only decline in intensity. Life expectancy exceeds 10,000 hours compared with 300 to 1000 hours for today's lamps. Even at 40,000 hours, EL lamps produce 25 to 50 per cent of their original output. Future uses include electroluminescent headliners, floor lights, and license plates.

Chevrolet Redesigns Trucks for 1960



ALL DRIVING and braking torque and drive forces in 1960 Chevrolet trucks are taken by control arms at front and rear, leaving springs free to absorb only vertical ride motions. The redesign is the first since 1956. Light trucks have rear coil springs and torsion bar front suspension. Front ends of the torsion rods rest in phenolic bushings. Medium and heavy trucks are using variable leaf springs in the rear and torsion bars in front. Front suspension arms are cast from pearlitic malleable iron instead of being forged. Steel wheel discs are spin formed instead of stamped. That helps cut wheel runout in half.

Chevy's light truck ladder-type frames are replaced with box section side rails and X member reinforcements. Result: Torsional rigidity is increased up to 11 per cent; beam strength is 21 per cent better. Engine mounts are designed so any of Chevy's truck engines can be mounted in any chassis without further changes. Standardization has reduced parts inventories 40 per cent. Heavy duty jobs have Teflon discs in front end ball joints to reduce wear and eliminate lubrication. Outlook: Those are the chassis designs that will support GM's turbine engine which is expected to appear first in trucks.

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STEEL Test Drives Corvair And Falcon . . .

Falcon's Final Specifications	
Weight	2366 lb
Wheelbase	109.5 in.
Length	181.1 in.
Width	70.0 in.
Height	54.5 in.
Front legroom	44.6 in.
Front headroom	38.9 in.
Rear legroom	40.1 in.
Rear headroom	37.3 in.

Corvair's Correct Dimensions	
Weight	2340 lb
Wheelbase	108.0 in.
Length	180.0 in.
Width	66.9 in.
Height	52.8 in.
Front legroom	42.8 in.
Front headroom	38.7 in.
Rear legroom	36.5 in.
Rear headroom	38.0 in.

OUR FEELING IS that Ford's Falcon . . .

. . . is a bit harder riding than the Corvair, but there's little doubt that it holds the road well and has few rattles or squeaks, even on rough test roads. The car's top speed seems about 90 mph. It will cruise well at 65 mph.

Acceleration, particularly in passing ranges, is sluggish. Engineers at Ford's test track indicate this may result from the axle ratio. The car presently has a 3.10:1 axle with manual shift, but 3.56:1 is available with the optional two stage automatic shift. This may help pickup, although the car has plenty of pep to get it across intersections and away from stop streets.

The six cylinder, 144 cu in. cast iron block engine turns out 90 hp at 4200 rpm. As stated in STEEL's June 1 issue, Falcon's intake manifold is cast integrally with the cylinder head to reduce weight and sealing problems.

Trunk space is 24.5 cu ft. The car has a 12 volt electrical system which is a definite advantage. Other construction features we find intriguing are galvanized steel rocker panels and the fact that the top of the gas tank acts as the trunk floor. Main bearings have replaceable inserts providing easy maintenance if you plan to hang on to the car for some years.

OUR FEELING IS that Chevy's Corvair . . .

. . . corners well and does not oversteer or understeer.

We've briefly checked out the car and find that the rear mounted aluminum engine does not detract from stable roadability.

While we haven't checked gas consumption, one Chevy engineer tells us he's been getting 34 mpg on straight driving. Our bet is that you'll do well to average 20 to 25 mpg in any of the Big Three economy cars with an automatic shift.

Brakes seem to be more than adequate, even on the 13 in. wheels. The unitized body is tight and, as advertised, there's plenty of room in front and rear seats for six persons. Our feeling is that the car could be a bit more responsive in acceleration, but it has enough pickup to insure safe getaways from stoplights and across intersections.

We've already talked about Corvair's 140 cu in. air cooled, pancake engine in earlier STEEL columns. The rear swing axle and independent suspension on all four wheels makes for a comfortable ride. The flat floor pan gives middle seat passengers plenty of legroom. The rear mounted automatic transmission (optional) has the shift lever on the dash similar to 1955 Chrysler models.

Four Door Sedan Tops

The four door sedan body style continues to be the top seller in Detroit's lineup says *Ward's Automotive Reports.*

It accounted for 34.5 per cent of the 1959 model output for the nine month period ended June 30. In the three prior model years, the four door sedan was a consistent standout, taking 34.2 per cent of 1958 production; 32.7 per cent of 1957's and 34.1 per cent of 1956's.

Chrysler Trucks Go South

Having finally gotten government approval of its plans, Chrysler International S. A. will start building trucks in Argentina. Chrysler plans to invest $15 million in the truck program.

To get its program underway, the company will import 400 machines, fixtures, and other tooling, much of it from the U. S. Half ton and 1½ ton trucks will be built and marketed in the country. Initial output is 4000 yearly. The figure is expected to reach 8000 a year when the program is fully developed. Chrysler's plant near Buenos Aires covers 500,000 sq ft. Another 30,000 sq ft is planned for transmission and axle assembly.

U. S. Auto Output

Passenger Only	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	557,994	337,446
July	555,418	321,017
August	238,773	180,447
8 Mo. Totals	4,078,153	2,743,812
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045
Week Ended	**1959**	**1958**
Aug. 8	108,240	65,614
Aug. 15	72,603	59,677
Aug. 22	31,848	25,918
Aug. 29	18,335	16,771
Sept. 5	15,674†	12,314
Sept. 12	20,000*	24,027

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

CASE HISTORIES

N/D achieves maximum axial and radial rigidity by matching two or three super-precision angular contact bearings having different contact angles. See figures 1 & 2 below.
FIG. 1
FIG. 2

Photo: courtesy Ready Tool Company

Bearing Design Helps Live Center Maker Achieve Accuracy of .000050"!

CUSTOMER PROBLEM:

Live center maker requires bearing design that will help achieve . . . and maintain . . . live center accuracy of .000050", under combination radial and thrust loads.

SOLUTION:

After thorough evaluation of the problem, New Departure recommended N/D pre-loaded, duplex ball bearings. Extensive testing proved these super-precise ball bearings resisted combination radial and thrust loads with minimum deflection. The N/D ball bearings, with medium and high contact angles, are mounted duplex and positively clamped together to assure the optimum, pre-determined preload condition. As work expansion increases the thrust load, radial centering becomes more rigid and accuracy is precisely maintained . . . to less than .000050" total indicator run-out!

When you're working on new designs that call for high precision ball bearings, why not call on New Departure? New Departure's consistent precision is your assurance of the ultimate in accuracy for your design. For more information, call the New Departure Sales Engineer in your area or write Dept. T-9.

Replacement ball bearings available through United Motors System and its Independent Bearing Distributors

NEW DEPARTURE

DIVISION OF GENERAL MOTORS, BRISTOL, CONN.

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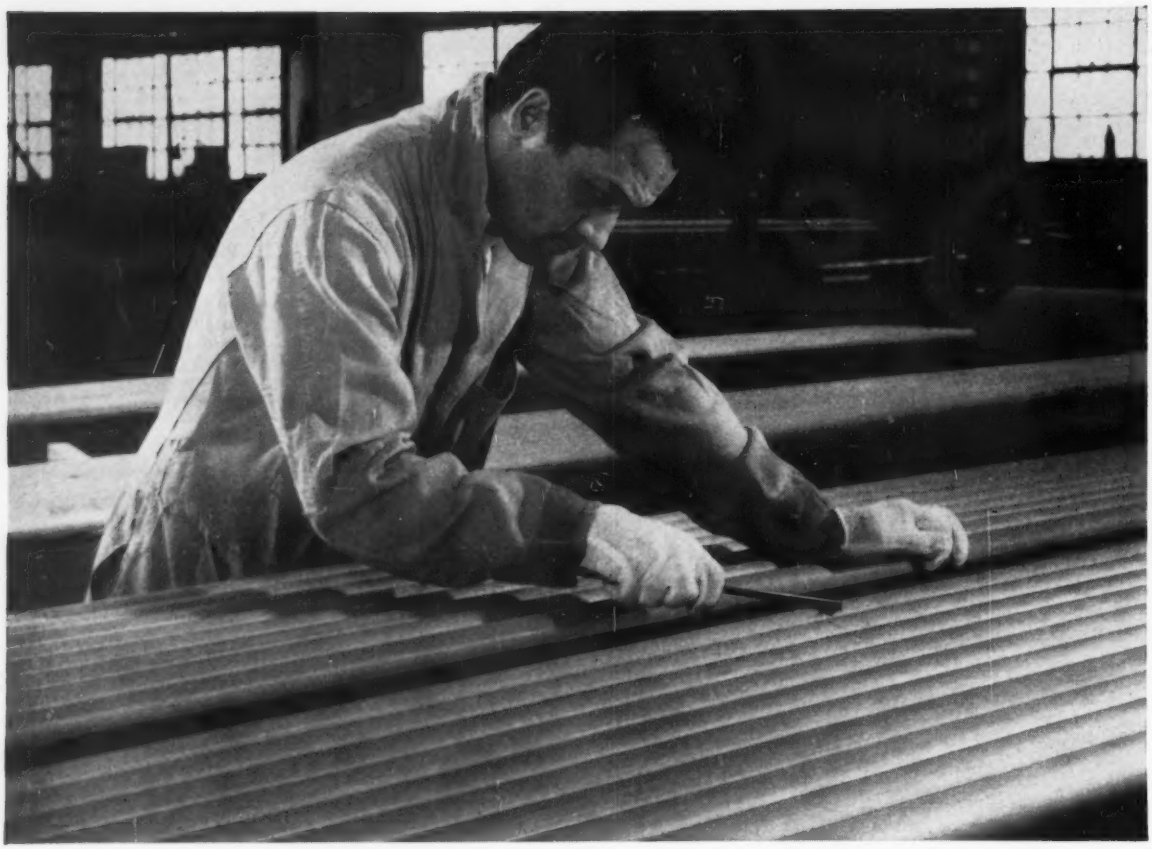

Stainless pressure tubing that gets white glove treatment

IF you're thinking of using stainless steel pressure tubing to solve a problem, make sure you get your money's worth. Timken® stainless steel pressure tubing is so carefully made it's literally handled with white gloves. That's typical of the quality that's built-in every step of the way. And you get this high internal quality and excellent surface finish, because:

1. **THE TIMKEN COMPANY** has one of the most modern, best-equipped seamless tube mills in the country.
2. **WE PIONEERED** in producing stainless steel tubing for pressure tube applications.
3. **MANY TECHNIQUES** we use are virtually unique in the steel industry.

Experts handle every production step—melting, piercing, finishing, testing, final inspection. The result is, you get the finest stainless pressure tubing you can buy. Tubing proved by performance in hundreds of applications.

Let Timken Company metallurgical experts help solve your stainless pressure tubing problems. You can get Timken stainless steel pressure tubing in a wide variety of sizes and grades—some not available anywhere else. Get the most for your money. Specify Timken stainless pressure tubing. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

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1. Quality that's uniform from heat to heat, bar to bar, order to order
2. Service from the experts in specialty steels
3. Over 40 years experience in solving tough steel problems

TIMKEN® *Fine Alloy* STEEL

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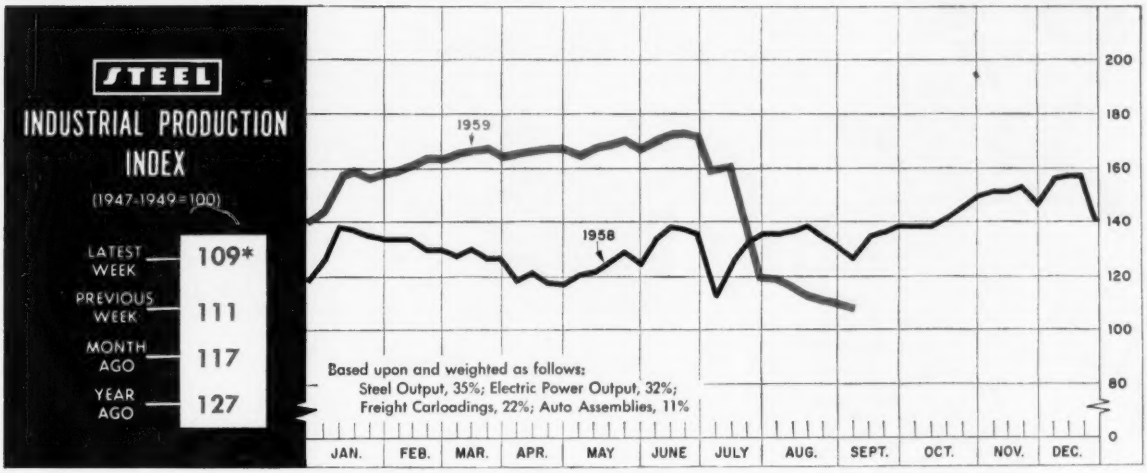


*Week ended Sept. 12.

Inventory Building Far from Over

BUSINESS CONDITIONS have a long way to go before they are vulnerable to another recession like that in 1957-58. For proof, take a look at inventories, one of the best indicators.

Just prior to the steel strike, total manufacturing and trade inventories reached $89.1 billion (seasonally adjusted) compared with the recession's low of $84.9 billion. Although the rate of climb was rapid, owing to the scramble for metals, the June level was still well below the all-time high of $91.3 billion set in August and September, 1957. No one knows the exact magnitude of liquidation resulting from the steel, copper, and lead strikes, but it's a safe bet that total inventory figures for August and September will be down significantly.

• **Important Relationships**—But inventories alone tell us nothing. When related to sales and orders, they take on meaning. And most recent figures give cause for rosy predictions once the metal situation settles down. At the current rate of shipments, total inventories are good enough for 1.45 months of business. (James Dawson, vice president and economist for National City Bank of Cleveland, says the warning light should flash when the figure approaches 1.6.) Moreover, the relationship has shown little change for several months.

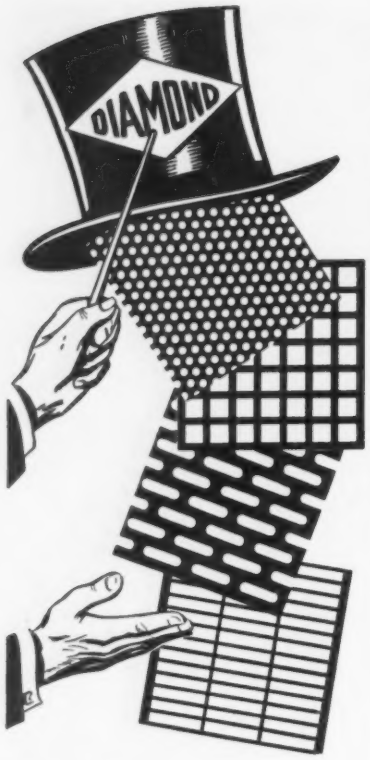
Reason: Both new orders and shipments have more than kept pace with stock buildup. If sales were to maintain the current rate of about $62 billion a month, an inventory level of $99 billion would not be out of line. However, it doesn't take much of a shrinkage in sales or expansion in stocks to boost the ratio, especially if the two actions are concurrent. What is likely to happen is an expansion of stocks to somewhere between the former high of $91.3 billion and $99 billion before anxiety sets in.

• **Timing**—How fast that will be

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	340[1]	332	1,780
Electric Power Distributed (million kw-hr)	13,900[1]	14,109	12,025
Bituminous Coal Output (1,000 tons)	7,625[1]	7,095	8,250
Crude Oil Production (daily avg—1,000 bbl)	6,820[1]	6,821	7,060
Construction Volume (*ENR*—millions)	$490.1	$293.0	$284.4
Auto, Truck Output, U. S., Canada (*Ward's*)	32,087[1]	35,488	17,870
TRADE			
Freight Carloadings (1,000 Cars)	545[1]	549	563
Business Failures (Dun & Bradstreet)	257	263	246
Currency in Circulation (millions)[3]	$31,932	$31,951	$31,379
Dept. Store Sales (changes from year ago)[3]	−7%	−1%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,114	022,736	$18,152
Federal Gross Debt (billions)	$290.4	$289.5	$278.5
Bond Volume, NYSE (millions)	$27.0	$22.5	$18.2
Stocks Sales, NYSE (thousands of shares)	11,576	10,505	11,800
Loans and Investments (billions)[4]	$105.2	$105.2	$94.3
U. S. Govt. Obligations Held (billions)[4]	$29.3	$29.4	$32.9
PRICES			
STEEL's Finished Steel Price Index[5]	149.96	149.96	149.28
STEEL's Nonferrous Metal Price Index[6]	220.4	220.9	198.3
All Commodities[7]	119.3	119.3	118.8
Commodities Other than Farm & Foods[7]	128.3	128.3	126.1

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.



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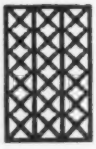
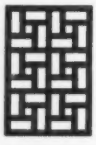
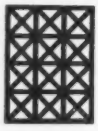
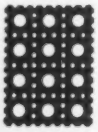
The popular Diamond Perforated-metal patterns shown above are only a few of the many illustrated and described in our 32-page Catalog No. 39. All of these standard patterns are available in a wide range of unit-opening sizes and we are always equally pleased to quote on original designs of any type or size.







Catalog 39 also illustrates and describes our high-quality lines of *Ornamental Cane*, Perforated-Metal Sheets for Accoustical installations and Heavy-Duty Architectural Grilles. Write, today, for a free copy.



Correspondence is especially invited regarding ANY requirement for perforated-metal panels or parts. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.

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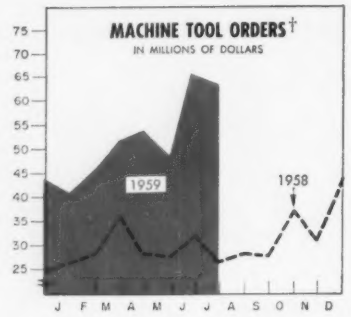
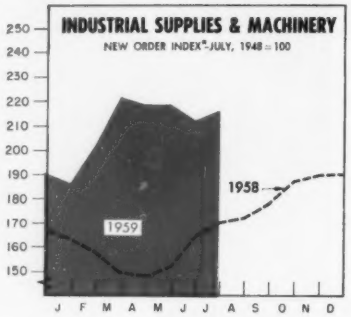
THE BUSINESS TREND





	New Orders 1959	New Orders 1958	Shipments 1959	Shipments 1958
Jan.	41,050	26,850	31,300	57,800
Feb.	45,400	28,300	36,050	48,050
Mar.	51,550	36,150	45,750	54,150
Apr.	53,200	28,300	45,000	50,900
May	48,700	28,050	41,000	50,100
June	65,400	32,100	50,050	45,500
July	63,450*	26,550	40,050*	29,700
Aug.	.....	28,300	.....	29,800
Sept.	.....	28,100	.....	34,900
Oct.	.....	37,000	.....	41,400
Nov.	.....	30,700	.....	33,650
Dec.	.....	43,900	.....	43,950
Totals	.....	374,300	.....	519,900

†Metal cutting and metal forming.
*Preliminary.
National Machine Tool Builders' Assn.
Charts copyright, 1959, STEEL.

	1959	1958	1957	1956
Jan.	186	163	221	190
Feb.	202	157	219	190
Mar.	221	149	210	190
Apr.	218	148	203	195
May	218	152	199	199
June	212	164	199	197
July	216	170	197	203
Aug.	...	172	197	211
Sept.	...	178	203	203
Oct.	...	187	192	206
Nov.	...	189	180	220
Dec.	...	190	167	218

*Seasonally adjusted.
Amer. Supply & Machinery Mfrs.' Assn.

accomplished will depend largely on how much steel metal fabricators will be willing to stock. Reports from purchasing agents' associations indicate they are not in any particular hurry to rebuild, at least not to the level prevailing immediately before the strike. But with business continuing to show improvement, they dare not take the chance of being caught short.

• **Backlogs Vulnerable**—One weakness in the current business picture is the low level of unfilled orders. At the peak of the 1955-56 boom, they stood at $64.2 billion. They dropped to $46.1 billion by last October, and they have recovered only slightly ($49.9 billion in June) despite the upturn in new orders. With capacity sufficient to produce at almost any level of foreseeable demand, the backlog picture is dim.

Some economists say that if a recession comes by mid-1960, it could be even steeper than the last because there would be less of a cushion of unfilled orders to fall back on. But with brighter prospects for capital goods (those items which have a longer leadtime and generally swell backlogs in an upswing), that situation should improve within the next two quarters.

Contract Awards Rise

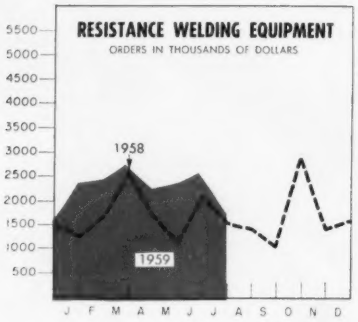
Construction awards started out in September as if they were trying to make up for the ground lost in disappointing August. *Engineering News-Record* reports that awards for the week ended Sept. 3 came to $490.1 million, restoring to 6 per cent the margin of 1959 to date over the corresponding period of 1958. It fell to 4 per cent a week earlier.

Industrial building contracts led the way, scoring the highest total since late in February. So far in 1959, more contracts have been awarded for heavy construction than in all of 1958.

But it remains to be seen whether the latest week was just a flash in the pan or the start of a recovery from a dismal August. Total awards last month were only $1,495 million, 25 per cent below the July level and 8 per cent below August, 1958. Public works dropped 32 per cent under the July figure, and private projects slumped 17 per cent.

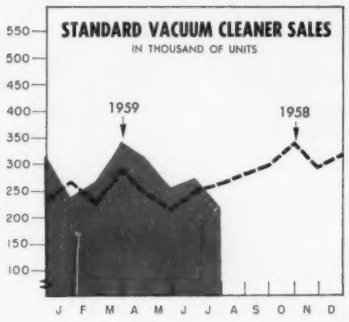
Boom in Making?

The present pace of general business will look like a "jog trot" when compared with the burst of speed



	Net Orders 1959	Net Orders 1958	Shipment 1959	Shipment 1958
Jan.	2,396	1,243	1,427	1,422
Feb.	2,457	1,683	1,889	1,615
Mar.	2,811	2,550	2,179	1,659
Apr.	2,258	1,684	2,193	1,963
May	2,407	1,121	2,019	1,750
June	2,597	2,113	2,702	2,346
July	1,797	1,534	2,257	2,342
Aug.	....	1,431	....	1,419
Sept.	....	1,060	....	1,125
Oct.	....	2,885	....	1,559
Nov.	....	1,409	....	1,102
Dec.	....	1,554	....	1,357
Totals	....	20,258	....	19,659

Resistance Welder Manufacturers' Assn.



	1959	1958	1957
Jan.	242 516	265,489	276,738
Feb.	271,396	225,631	300,887
Mar.	346,557	291,418	312,746
Apr.	317,402	247,293	281,627
May	257,345	218,766	231,246
June	273,600	253,127	207,286
July	221,232	263,778	218,276
Aug.	.....	280,226	241,218
Sept.	.....	299 618	302,869
Oct.	.....	339,127	328,655
Nov.	.....	293,609	251 123
Dec.	.....	316,965	237,501
Totals	.....	3,295,047	3,190,172

Vacuum Cleaners Mfrs.' Assn.

which seems certain to follow the strike settlement, says Addison T. Cutler, special economist at the Federal Reserve Bank of Cleveland.

The strike cut only 4 or 5 points out of 115 in the FRB industrial production index between June and August, he feels. It stopped the advance of the gross national product in the third quarter as well, but he looks for no decline from the second quarter figure.

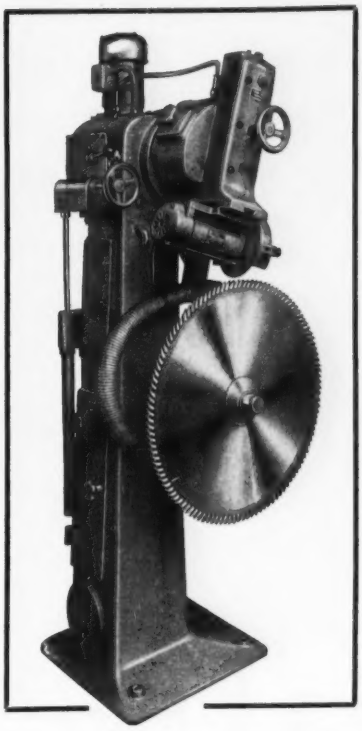
Once things get back to normal, the fourth quarter should be strong enough to raise the FRB industrial production index average for the year from 8 to 12 per cent above the 134 (1947-49=100) average of last year. The percentage gain for GNP will be only slightly less. In 1958, it was $441.7 billion.

Index Dips with Autos

STEEL's industrial production index dipped another 2 points to a preliminary 109 (1947-49=100) for the week ended Sept. 5 as the auto industry came to the close of its 1959 model run. Labor Day will keep the trend line depressed through the week ended Sept. 12, but new car production should be enough next week to overcome any dip in electricity output and further strike-caused slashes in railroad freight carloadings. Steel production, which has been running close to 12 per cent of capacity since the start of the strike, will remain a neutral factor until a short time after the contract settlement.

Trends Fore and Aft

- Heat treaters booked $3,259,700 worth of new business in July, up 52.2 per cent from the year-ago month, says the Metal Treating Institute.
- Joseph A. Grazier, president of American Radiator & Standard Sanitary Corp., expects no significant increase in home building during the fourth quarter. His company is budgeting for about 1.2 million home starts in 1959. (The current rate is over 1.3 million.)
- Intercity truck tonnage is maintaining its 20 per cent edge over corresponding 1958 figures despite the steel strike, reports American Trucking Associations.
- The index of business activity in Southern California compiled by the Security First National Bank of Los Angeles advanced in July for the 16th consecutive month and set a record for the tenth straight month.



WAGNER automatic saw blade sharpener with indexing device

New standards for modern circular saw blade grinding are established with this new Wagner machine. The indexing mechanism of the LT model produces correct tooth forms automatically without the use of index plates. Totally enclosed direct drive motors equip this new sharpener with independent drives for the grinding spindle, four-speed indexing drive and exhauster. The LT model has vertical adjustment for saw blades 10" to 52" in diameter and rotary adjustment for cutting angles from 0° to 30°.

Two index plate type models available:
Model LS—capacity of 10" to 52";
Model MS—capacity of 12" to 72".

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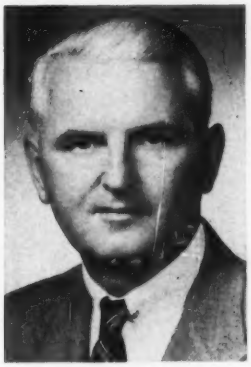
THOMAS W. MORRISON
SKF eng.-research dir.



RAYMOND T. KLEMPAY
McKay Machine v. p.

H. K. Porter Company Inc.'s **National Electric Div.** appointed **Kenneth C. Crain Jr.** works manager, **Robert Johnson** director of engineering. Mr. Crain was works manager of the division's Wire & Cable Div. Mr. Johnson joined National Electric in 1948 as chief engineer of the Steel Div. Other appointments include **Everett L. Kimball** as steel engineering manager, and **Robert A. Ditchendorf** as industrial engineering manager. All four have headquarters at National Electric's Ambridge, Pa., Works.

Leon C. Koenig was made vice president-manufacturing at **Lindberg Engineering Co.**, Chicago. He was assistant secretary and plant manager.

F. H. Foglesong fills the new post of manager-allov sales, Tubular Products Div., **Babcock & Wilcox Co.**, Beaver Falls, Pa. He is succeeded as manager of the division's Detroit district sales office by **A. D. Zar.**

Charles W. Beauchamp was made marketing manager, heading all sales activites of **Link-Belt Co.'s** Ewart plant in Indianapolis. **Kendrick M. Hickman** was made sales manager. The appointments follow retirement of **Forest H. Spencer,** sales manager.

L. J. Frey was made operations manager, **American Steel Band Co.,** Pittsburgh. He was general sales manager of the affiliate company, **Allegheny Steel Band Co.,** and is succeeded by **R. K. Scharff,** former eastern division manager.

Thomas W. Morrison was made director of engineering and research, **SKF Industries Inc.,** Philadelphia. He succeeds **Gunnar Palmgren,** vice president-engineering and research, who retires at the end of the year. Until that time, he will serve as vice president and special consultant to the president.

Frank M. Rea was named manufacturing operations manager; **John H. Hagen** industrial relations director, new posts in the industrial products group at **Minneapolis-Honeywell Regulator Co.,** Minneapolis.

Ed Bartz was made sales manager, **Airline Welding & Engineering,** Hawthorne, Calif.

Colin I. Bradford, former president of Rem-Cru Titanium Inc., was appointed director of metal products in the Pigments Dept. of **E. I. du Pont de Nemours & Co. Inc.,** Wilmington, Del. Operation of the company's metallurgical development facility at Baltimore, to be completed by the fall of 1960, will be under Mr. Bradford's general supervision. **Elbert M. Mahla** was named technical manager for metal products; **Frederick M. Allen,** superintendent of the Baltimore installation.

Dr. Donald G. Wilson was made assistant vice president, Electronics Div., **Stromberg - Carlson Div.,** Rochester, N. Y., General Dynamics Corp. **William G. Alexander** succeeds Dr. Wilson as general manager of Stromberg - Carlson - San Diego, Calif.

Raymond T. Klempay was named vice president-engineering, **McKay Machine Co.,** Youngstown. He continues as vice president-general manager, Metal Processing Machine Co., subsidiary.

George H. Muth, former assistant to the executive vice president, Metal Div., **Continental Can Co.,** New York, was named co-ordinating engineer in charge of the company's coil stock facilities and operations. He succeeds **A. A. Baker,** made manager of production engineering, Eastern Metal Div.

John J. Gattoline was made sales manager, **Daystrom Transicoil Div.,** Worcester, Pa., Daystrom Inc. He was vice president of E. W. Larrabee Inc.,

Louis C. Goad, executive vice president of **General Motors Corp.,** Detroit, was given jurisdiction over all general staff activities of the corporation. **Sherrod E. Skinner** and **Cyrus R. Osborn** were elected executive vice presidents. Mr. Skinner succeeds Mr. Goad in charge of the Automotive, Body and Assembly, and Parts Divisions. Mr. Osborn has jurisdiction over the Engine Divisions; the Dayton, Household Appliance and Electro-Motive Group, and the Overseas and Canadian Group. **Nelson C. Dezendorf,** GM vice president and general manager of Electro-Motive, was elected vice president in charge of the Dayton, Household Appliance and Electro-Motive Group. He is succeeded at Electro-Motive by **Richard L. Terrell. Roger M. Kyes,** whom Mr. Dezendorf succeeds, was named vice

FRED A. KLEMACH
Vicker's missile mgr.

JAMES E. LOCKWOOD
Greist Mfg. v. p.

WILLIAM J. PINKERTON
Micromatic Hone exec. v. p.

JOHN P. KNAPP
Roessing Bronze tech. dir.

president for the Accessories Group, replacing Mr. Skinner in that post.

Fred A. Klemach was appointed manager-missile systems for **Vickers Inc.**, Detroit. Since joining Vickers in 1957, he has been assigned as a senior staff engineer, specializing in missile applications.

Richard M. Reisel was made engineer in charge of the Commercial Crane & Excavator Div., Engineering Dept., **Bucyrus-Erie Co.**, Milwaukee.

Thomas G. Paterson Jr., purchasing agent, **Gates Rubber Co.**, Denver, was named director of purchases and traffic.

Charles J. Schmidt was made director of the Research & Development Div.'s Radiation Laboratory at **W. L. Maxson Corp.**, New York.

Donald F. Ross was promoted by **Carpenter Steel Co.** to Dayton-Cincinnati district manager.

James W. Miller was made assistant sales manager, **Toledo Desk & Fixture Co.**, Maumee, Ohio.

Walter B. Claus was named staff assistant to the director of manufacturing at **ElectroData Div.**, Burroughs Corp., Pasadena, Calif. He was with the B. J. Electronics Div. of Borg-Warner Corp. as assistant chief engineer-administration.

R. H. Presnall was made assistant sales manager, **Gisholt Machine Co.**, Madison, Wis. He is succeeded as Pittsburgh district sales manager by **William Nyberg. R. H. Stebbins** was named sales manager of the company.

James E. Lockwood was appointed vice president, **Greist Mfg. Co.**, New Haven, Conn., in charge of market research, product research and development, and diversification program. He was vice president, treasurer, and secretary of Safety Industries Inc.

William J. Pinkerton was appointed executive vice president and assistant general manager, **Micromatic Hone Corp.**, Detroit. He was administrative vice president.

Rheem Mfg. Co., Chicago, appointed three divisional vice presidents in its Container Div.: **William S. Goodfellow**, vice president-marketing; **C. R. Jones**, vice president-controller; **O. X. Pitney**, vice president-operations.

R. C. Ridley was promoted to assistant to the vice president, Wire & Cable Div., **Copperweld Steel Co.**, Glassport, Pa. He was assistant sales manager at the Glassport plant.

James R. Robertson joined the sales staff of **Harper Electric Furnace Corp.**, Buffalo. He will direct expansion of activities in marketing gas-fired heat treating and nonferrous melting furnaces. Mr. Robertson was president and general manager of Wayne Industrial Furnace Co.

Charles B. Lee joined **Control Data Corp.**, Minneapolis, as director of engineering for its Cedar Engineering Div.

Edward J. Sydor was appointed chief engineer, **Cycleweld Chemical Products Div.**, Detroit, Chrysler Corp.

John P. Knapp was appointed technical director of **Roessing Bronze Co.**, Pittsburgh. He previously served as research specialist, process metallurgy, for Aluminum Co. of America, New Kensington, Pa.

Henry Davis Jr. was named field sales manager, Mechanical Goods Div., **United States Rubber Co.**, New York. He replaces **Matthew J. Delehaunty**, recently named to the new post of market planning manager of the division. **Douglas M. Smith** replaces Mr. Davis as eastern regional manager, Passaic, N. J.

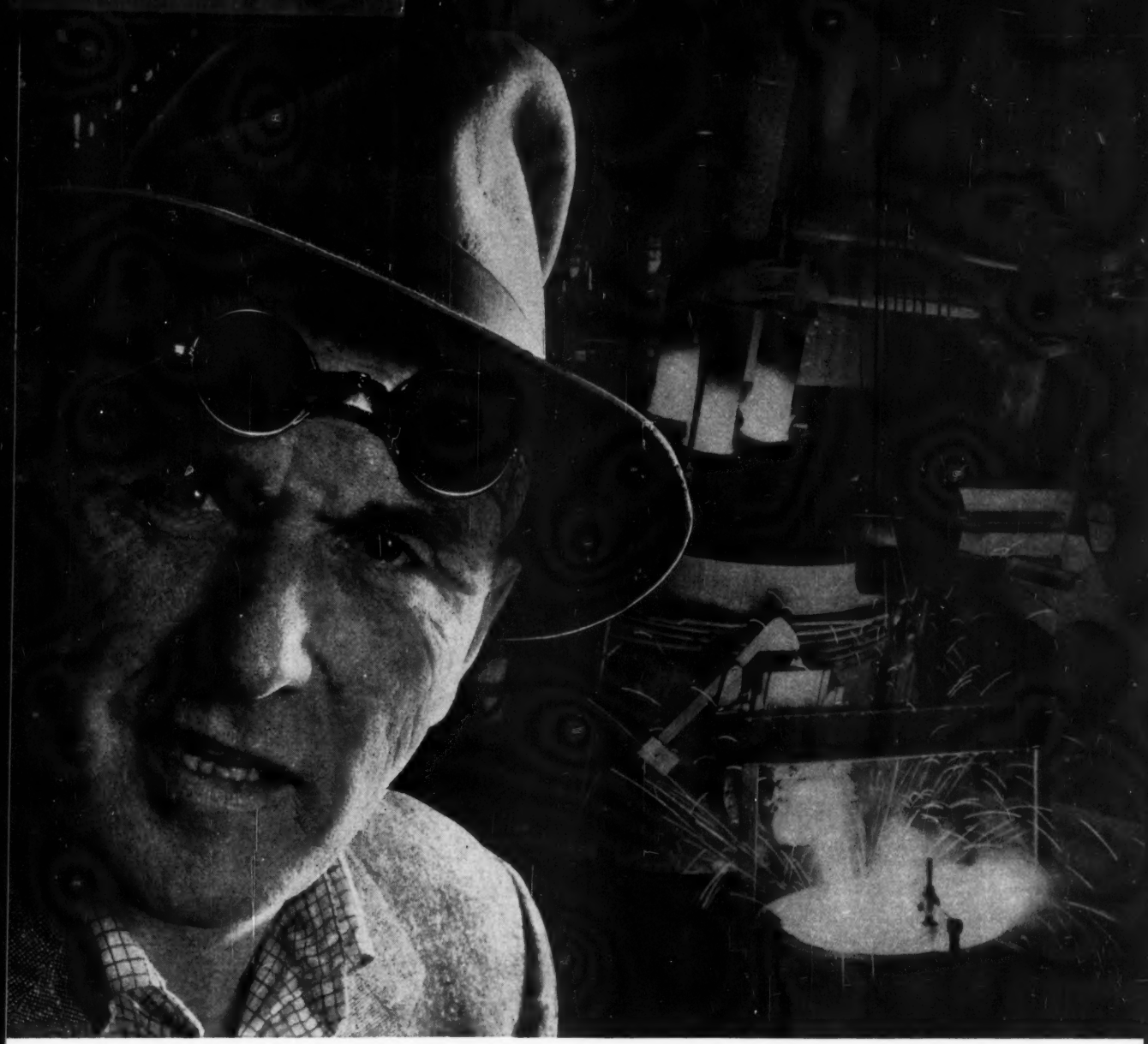
Edward A. Voss was made manufacturing manager, Cincinnati Div., **Bendix Aviation Corp.**

Robert L. Wiseman was appointed vice president-sales, **Microcast Products Div.**, Austenal Co., New York.

Harry N. Pappas was appointed vice president - operations, **Globe Dismantling Corp.**, Glassport, Pa He was formerly associated with Westinghouse Electric Corp.'s Bettis Atomic Power Laboratory, and General Electric Co.'s Aircraft Gas Turbine Div.

John H. O'Neil, former head of **Boston Gear Works's** Cleveland branch, was appointed assistant manager of field sales, operating from the Quincy, Mass., home office.

William L. Govan, chief project engineer, **Loewy-Hydropress Div.**, Baldwin-Lima-Hamilton Corp., New York, was given additional duties of product sales manager, hydraulic machinery. **Gerald L. Sanders** was made product sales



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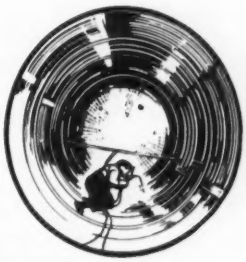

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BERNARD F. GOFBERG
Arnot-Jamestown gen. mgr.

CHARLES F. SIMMERS
asst. chief eng.-Koppers

GEORGE W. WEILER
Bendix missile post

MATTHEW M. GOUGER
DataGraphic president

A. LEE GRAHAM
American Forge v. p.

RICHARD C. HENSHAW
Lord Mfg. operations

manager, Rolling Mill Dept. He was assistant sales manager-rolling mills.

Matthew M. Gouger was elected president, **DataGraphic Systems Inc.** He is also vice president and a member of the management committee of General Aniline & Film Corp., New York.

A. S. Puelicher was elected to succeed **W. L. Litle** who resigned as chairman of **Bucyrus-Erie Co.**, South Milwaukee, Wis. **Robert G. Allen**, Bucyrus-Erie president, succeeds Mr. Litle as chief executive officer.

William J. Fitzgerald was made manager of market research, **American-Standard Industrial Div.**, Detroit, American Radiator & Standard Sanitary Corp.

Frank X. Bujold was named general manager, **Frauenthal Div.**, Kaydon Engineering Corp., Muskegon, Mich. He was manufacturing manager - foundries, Engine & Foundries Div., Ford Motor Co.

A. Lee Graham, plant superintendent of **American Forge & Mfg. Co.**, McKees Rocks, Pa., was named vice president-operations.

Richard C. Henshaw was appointed manager of operations, **Lord Mfg. Co.**, Erie, Pa. He was manager of the Engineering Div.

Roger A. Swanson fills the new post of product sales manager-microwave diodes for the Semiconductor Div., **Sylvania Electric Products Inc.**, Woburn, Mass.

Earl D. James was made manager, Strip Steel Dept., **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp. He succeeds **George F. Harmuth**, retired. **John D. Sutherland** was named assistant general superintendent.

Union Carbide Metals Co., Niagara Falls, N. Y., a division of Union Carbide Corp., named **D. D. Barbor** manganese product manager-sales; **A. H. Barnes** chromium product manager-sales.

Bernard F. Gofberg was named general manager, **Arnot - Jamestown Div.**, Royal Metal Mfg. Co., Warren, Pa. He continues as vice president of Deluxe Metal Products Co., also a division.

Charles F. Simmers was appointed assistant chief engineer, Engineering & Construction Div., **Koppers Co. Inc.**, Pittsburgh. He was in consulting engineering work on rolling mill equipment and special steel mill cranes before joining Koppers, and served for 11 years with Morgan Engineering Co., most recently as vice president-engineering and member of the operating committee.

Bendix Products Div. - Missiles, **Bendix Aviation Corp.**, Mishawaka, Ind., promoted **George W. Weiler** to chief electronic engineer, responsible for design of all Talos missile electronics systems. **Lathan E. Baker** was promoted to chief inspector, responsible for early missile tests and all inspection departments. **Bert F. Prentiss** was named assistant chief inspector.

Robert J. Offringa, former director of marketing, **Kawneer Co.**, Niles, Mich., was elected vice president-eastern area sales. **Stephen A. Furbacher**, general manager, was named vice president, Mill Products Div., St. Charles, Ill. **Jack M. Roehm**, former director-research and development, was elected vice president-research and development. **W. Jack Woodruff** was made vice president, Appliance Products Div., Cynthiana, Ky.

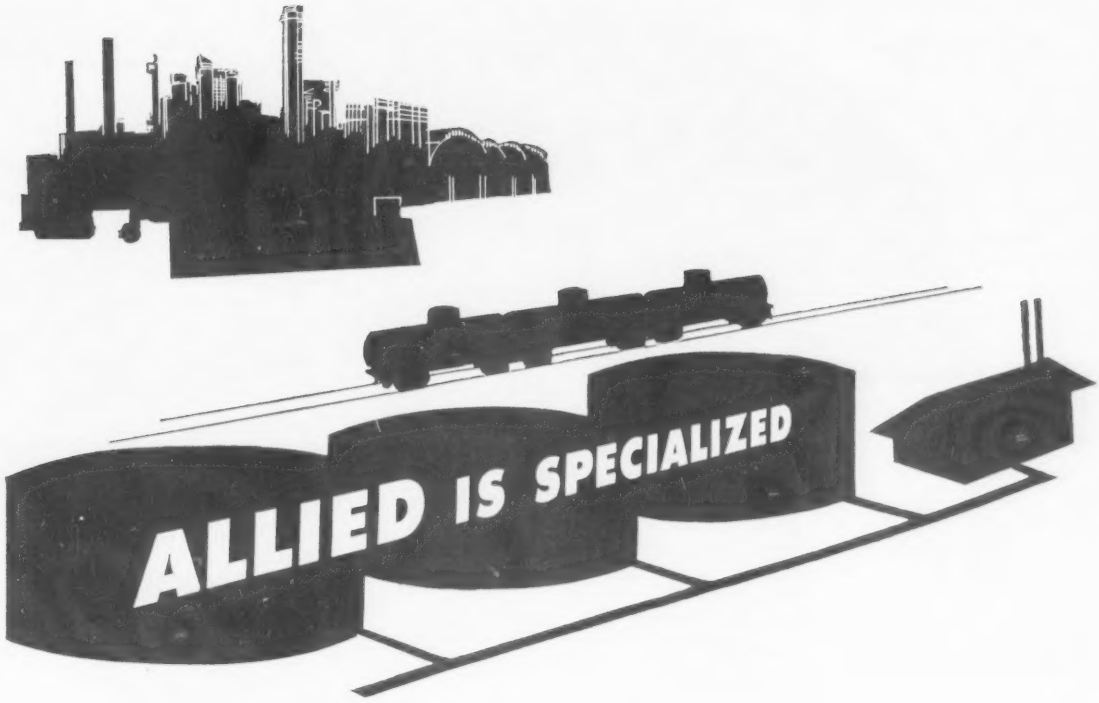
OBITUARIES...

Charles H. Reynolds, 68, retired vice president, **Sheffield Corp.**, Dayton, Ohio, subsidiary of Bendix Aviation Corp., died Aug. 31.

G. Reagh Atkinson, vice president, **Mid-West Abrasive Co.**, Owosso, Mich., died Sept. 1.

G. A. Shallberg, 83, former executive vice president and chairman of the executive committee of **Borg-Warner Corp.**, Chicago, died Aug. 29.

Edward J. Finnegan, 53, traffic manager, Metals Div., **Olin Mathieson Chemical Corp.**, New York, died Aug. 26.



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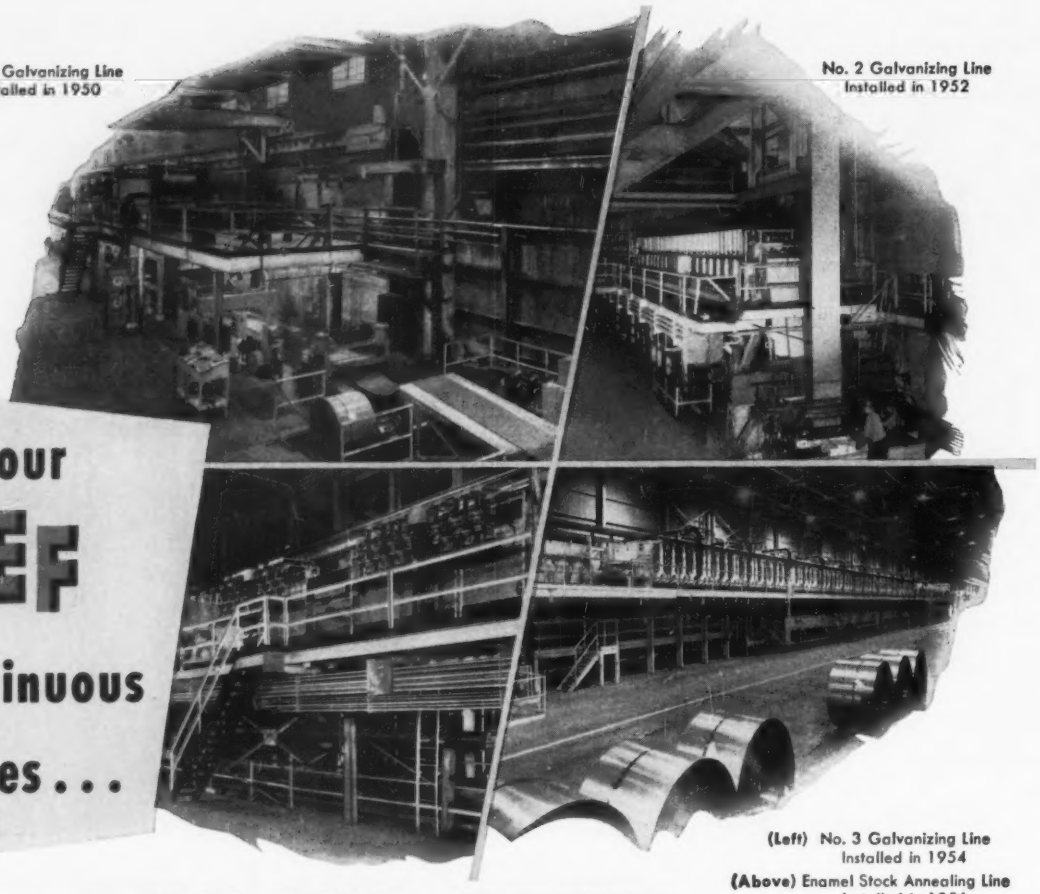

No. 1 Galvanizing Line
Installed in 1950

No. 2 Galvanizing Line
Installed in 1952

(Left) No. 3 Galvanizing Line
Installed in 1954

(Above) Enamel Stock Annealing Line
Installed in 1956

Four EF Continuous Lines... at INLAND STEEL

provide efficient 24 hours a day, 7 days a week operation at high efficiency, with no unscheduled downtime.

TOTAL DESIGN CAPACITY IN EXCESS OF 617,000 TONS PER YEAR*

Repeat orders are the highest endorsement a furnace builder can earn. Tailored to meet Inland's specific requirements, and incorporating the most advanced technological improvements, these four EF continuous lines assure accurately controlled cycling, maximum production and maximum return per dollar invested.

The unvarying day after day uniformity of product physicals, assure highest market acceptance, and make subsequent forming and fabricating operations more efficient and less costly.

For up to the minute engineering, outstanding performance, and greatest return on your investment, on any continuous — or batch — ferrous or non-ferrous heat treating project, you'll find, like Inland, that "it pays to call the EF furnace engineers".

*Tonnage output will vary depending upon width and gauge of strip being processed.

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THE ELECTRIC FURNACE CO.

Gas-fired, Oil-fired and Electric Furnaces for Heat Treating any Product, Using any Process, any Hourly Output.

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Marketers Study Growth

You can hear lots of expansion tips at meetings of the Association for Corporate Growth & Diversification. Francis W. Lanigan, right, is president

BUSINESSMEN with an eye peeled for company growth or product diversification can find an informative ally in a young New York City marketing association with a unique name.

The Association for Corporate Growth & Diversification Inc. was organized by New Yorkers who felt that no other group offered enough information on the important steps of product development or corporate growth through acquisition. The association may eventually become nationwide, since its nonresident membership is not limited, although only 100 New Yorkers may belong.

• **Diverse Membership** — Meetings, held once a month over luncheon in a New York hotel, attract members from such varied industries as foods, chemicals, packaging, automotive, electronics, aircraft, railroad equipment, and industrial machinery. Headquarters are in the office of this year's president, Francis W. Lanigan, a vice president of Benton & Bowles Inc., advertising agency.

Meetings consist of informal, off-the-record talks by business leaders. At one, Sander Peter Alexander, co-ordinator of financial analysis, Sylvania Electric Products Inc., discussed "Prior to Acquisition—What Do You Need and Where Do You Get It?" At another, "A Banker Looks at New Products" was presented by William H. Hastings of Harriman, Ripley & Co.

Subjects scheduled cover a broad range: From "The European Common Market," discussed by L. K. Neidliner, executive director, U. S. Council, International Chamber of Commerce, to "Automation as a Factor in Long Range Planning," by Joseph L. Harrington Jr., Alfred B. Little Inc.

The idea, says Mr. Lanigan, is to alternate experts in product development and authorities on the how, when, and where of corporate acquisition.

After his prepared presentation, each speaker faces a barrage of questioning from the floor. Transcripts of all talks are published for the use of members. A sometime periodical, the *Periscope,* is also distributed.

Meetings are held on the second Tuesday of every month, from September to June. Out of town businessmen may attend either as members or as guests.

Tests Gas Turbine Blower

Westinghouse Electric Corp., Pittsburgh, has conducted final tests of the gas turbine for blowing blast furnaces which will be installed at U. S. Steel Corp.'s South Works at Chicago. The system, supplying 125,000 cu ft of air per minute to the blast furnaces, will eliminate the need for a boiler in its auxiliary equipment, since the blast furnace gas is burning directly in the gas turbine. The connected axial compressor supplies air to the blast furnace and to the combustion system of the gas turbine.

Expands Tungsten Plant

Union Carbide Nuclear Co., a division of Union Carbide Corp., New York, is expanding its tungsten refining plant at Bishop, Calif. The new unit will enable the company to produce high purity tungsten raw material, ammonium paratungstate, at the mine site. The final product contains less than 0.003 per cent each of molybdenum and silicon.

Halts Stamping Operation

Rush Stamping Co., Toledo, Ohio, has ceased operations and will offer its machinery at public auction Sept. 15. Eliot M. Meisel is president.

Shifts Lithium Ore Source

Lithium Corp. of America Inc., Minneapolis, has terminated its contract to purchase spodumene ore concentrates from Quebec Lithium Corp. The company intends to resume the mining and use of its own North Carolina ore in 1960, when its present inventories of concentrates and raw ores will have been exhausted. Large deposits of lithium bearing ore are located within 15 miles of its plant at Bessemer City, N. C.

Enlarges Power System

Increasing power requirements for blooming mill operations at Youngstown Sheet & Tube Co.'s Brier Hill Works, Youngstown, led to installation of a 3000 ft long transmission line and a 69,000 kva capacity substation. Previously, the blooming mill was driven by a steam engine. Installation of the transmission line required use of nine steel

(*Please turn to Page* 144)

CUTLER-HAMMER

First in compactness • flexibility • and wiring simplicity

8-Hi Unitrol packs more control into less space

Each *side* of a single Unitrol *section* will hold *eight* size 1 control units . . . or *five* size 2 units . . . or *four* size 3 units. And these are *NOT* "stripped-down" units. The new compact design provides space for optional components such as control circuit fuses, control transformer, terminal boards, three-coil overload relays, and pushbuttons and indicating lights.

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CONTROL
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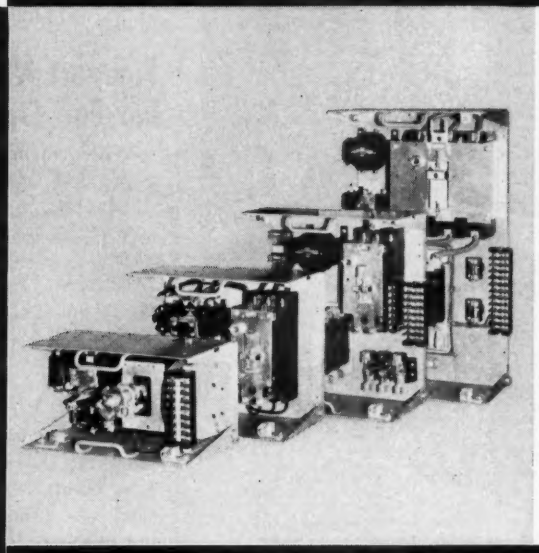
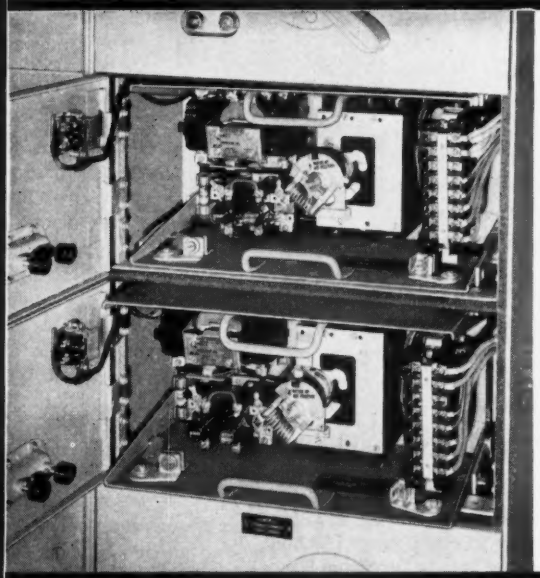


8-Hi Unitrol offers extra control center flexibility

Control units for the new 8-Hi Unitrol are available in both the standard and new compact design for maximum selectivity and flexibility. Add to this the modular construction and see how easily the control units can be combined to create a flexible, space-saving control center. On-the-job modifications are easily made . . . 8-Hi Unitrol keeps pace with changing requirements.



8-Hi Unitrol is easier, safer to install

Available in types A, B, and C construction with Class 1 or 2 wiring, you can select the 8-Hi Unitrol that affords the greatest installation economy. Cost-cutting, time-saving features include U-shaped control units assure wide-open visibility . . . no buried components. "Safety-lock" test position insures safe wiring and testing. "Plug-in" power contacts are self-aligning . . . no hazardous manual adjustments.

Be sure you have all the facts about Cutler-Hammer 8-Hi Unitrol . . . its many extra features assure you more economical installations, and the most dependable performance. Write today for the new descriptive Bulletin EN142-S213. Cutler-Hammer Inc., Milwaukee 1, Wis.

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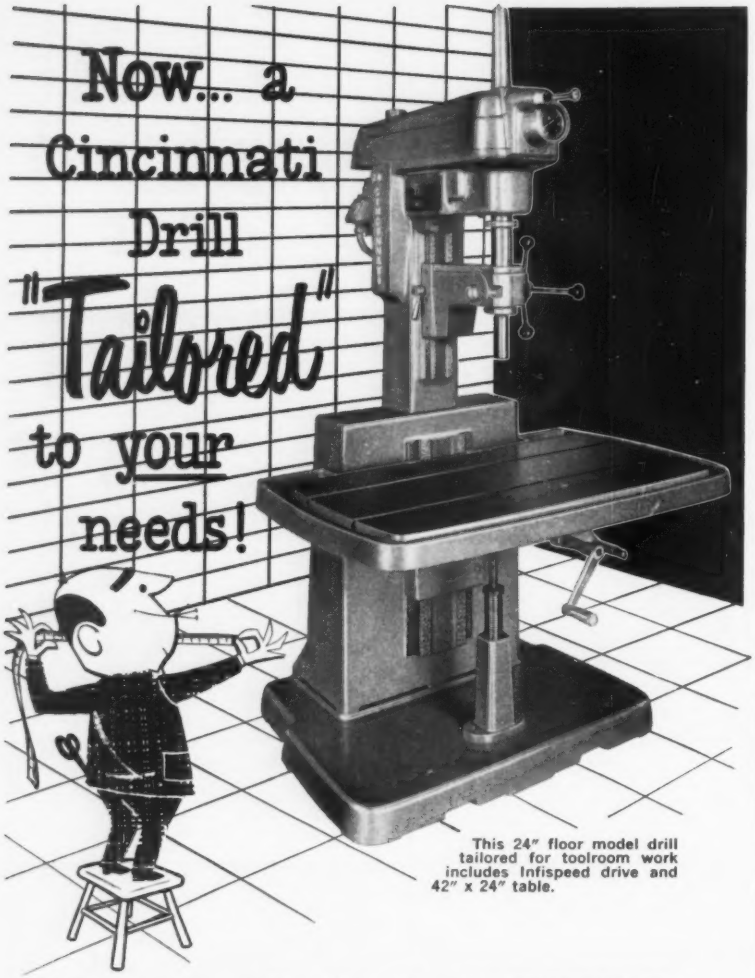

This 24" floor model drill tailored for toolroom work includes Infispeed drive and 42" x 24" table.

Buy your new medium duty 16" or 24" CINCINNATI Sliding Head Drill *just as you want it*—with selected specialized equipment factory-installed and tested! Buy only the cost-saving combination you need to suit your toolroom, production or job shop requirements EXACTLY!

NEW BACK-GEAR SPINDLE DRIVE

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INFISPEED VARIABLE SPEED DRIVE

OTHER COMBINATIONS

Geared and Air Power Feeds, Manual and Automatic Work Holding Fixtures, Plain or T-Slotted Work Tables, Variety of Spindle Types and Sizes, Motor Driven Coolant Pump.

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"TRAY-TOP" Lathes • "CINCINNATI" Drilling Machines
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(*Concluded from Page* 141)

towers, fabricated by Blaw-Knox Co., Pittsburgh.

A similar improvement in power transmission facilities is scheduled later this year at the firm's Campbell Works, Campbell, Ohio, where ten additional Blaw-Knox towers and a substation unit will be erected to handle added power requirements for a $50 million expansion of a 79 in. hot strip mill.

Freeport Nickel Prepares For Full Operations

With construction in the final stage, Freeport Nickel Co.'s nickel-cobalt project (comprising mining and ore concentrating facilities at Moa Bay, Cuba, and a refinery at Port Nickel, La.) is gearing up for production.

The first ore has been mined and put through the slurry plant which prepares it for the concentration process. The hydrogen and hydrogen sulfide plants and the powerplant are in operation. The sulfuric acid plant has been tested and is ready for production. The remaining units are to go on stream in the next several weeks.

The Louisiana refinery is awaiting the first shipment of nickel-cobalt sulfide concentrate and is expected to begin production of nickel and cobalt as briqueted or powdered metals about six weeks after the Moa Bay facility is in full operation.

Annual capacity of the Louisiana refinery is 50 million lb of nickel, 4.4 million lb of cobalt, and 90,000 tons of ammonium sulfate. The company is a subsidiary of Freeport Sulphur Co., New York.

Will Close Casting Shop

International Harvester Co. will discontinue nodular iron foundry operations at the McCormick Works, Chicago, late in 1961 or early in 1962 at the same time it closes out manufacturing operations there. When the announcement was originally made (STEEL, May 4, p. 69) that Harvester would gradually discontinue manufacture of farm equipment at the McCormick Works, it was stated that foundry operations would be continued.

Mark V. Keeler, vice president of the Farm Equipment Div., says

FLIGHT FORGINGS

BY CAMERON
WHEN DEMANDS ARE CRITICAL

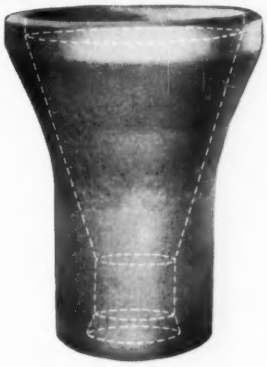
The Cameron split-die forging process has created a new concept in forged components that fly. Parts which must handle new extremes in temperature and mechanical stress are now in routine production at Cameron. As an added benefit interesting economies result from savings in the critical materials, often in short supply, which are specified for these important parts.

Our facilities are complete through every production phase. We melt many of our own special alloys, bloom, forge, heat-treat, and perform machining operations when required. Each of the shapes below was a problem when presented to our Special Products Division. They are now current production items, adding to our ever-increasing list of extreme service solutions.

Forging of a Refractory Throat for Missile
Material: Tantalum 90%
Tungsten 10%
Outside Diameter of Large End: 6.25″
Height: 4″
Outside Diameter of Small End: 5.25″
Weight: 42.25 lbs.

Forging of Turbine Rotor Stub Shaft for Nuclear Jet Engine
Material: A-286 Steel
Outside Diameter of Cone End: 33.687″
Outside Diameter of Shaft: 10.375″
Height: 44.875″
Weight: 1150 lbs.

Forging of a J-93 Front Turbine Shaft for Aircraft Gas Turbine Engine
Material: Waspalloy
Diameter of Conical End: 23.38″
Diameter of Hub End: 6.50″
Length: 27.68″
Weight: 430 lbs.



Forging of a Liner — Exit Cone Missile
Material: Unalloyed Arc Cast Molybdenum
Diameter of Large Conical End: 10.50″
Height: 12.89″
Diameter of Small Conical End: 6.75″
Weight: 104.5 lbs.

If your forging demands are critical, write, call, or come by —

Cameron
IRON WORKS, INC.
SPECIAL PRODUCTS DIVISION
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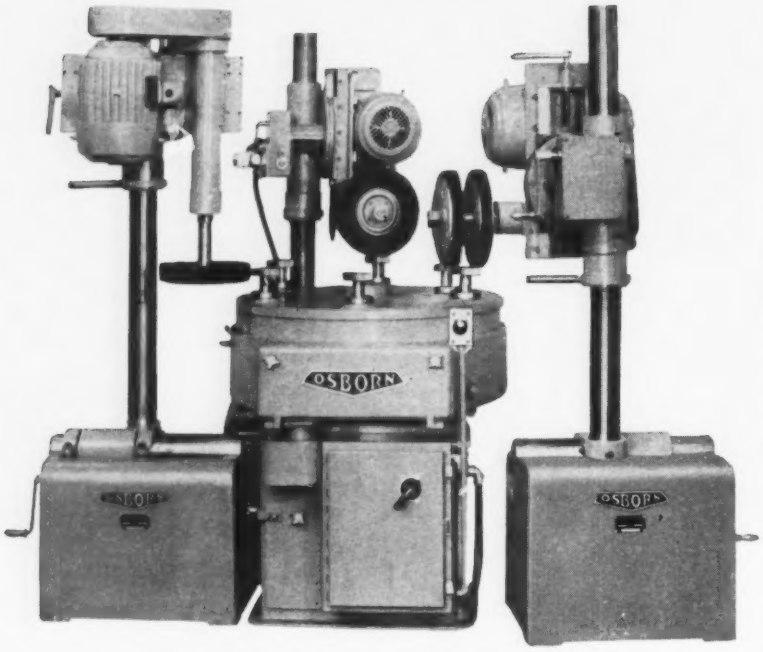
Cut your metal finishing costs with this...

NEW OSBORN BRUSHAMATIC® ROTARY INDEX MACHINE



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Units can range from manual to fully automatic operation.

Unique "building block" design means unlimited production flexibility

NEWEST ADDITION to Osborn's broad line of metal finishing machines are these Brushamatic® Rotary Index units. Capability: significant increase of your production capacity.

Most important feature—production men can economically "build" *custom* Brushamatic Machines from *basic "building block"* components . . . brushing heads, index tables and electric controls. Other advanced design and construction features make these new Brushamatic units worth your immediate investigation.

Your Osborn field specialist has latest application data on a wide range of cost-saving finishing methods. And an **O**sborn **B**rushing **A**nalysis—made in your plant—is the first step to pinpoint savings on *your* operations. Write for details. *The Osborn Manufacturing Company, Dept. S-12, Cleveland 14, Ohio.*

THE OSBORN MANUFACTURING COMPANY

METAL FINISHING MACHINES...AND FINISHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES
FOUNDRY PRODUCTION MACHINERY

OSBORN®

that the only operations remaining at the plant will be annealing of malleable iron castings made at the firm's Waukesha, Wis., plant. Harvester plans to concentrate its nodular iron foundrywork in its Memphis, Tenn., plant.

Canco Adds Coil Center

The ninth unit in American Can Co.'s network of coil processing centers is being installed in its Halethorpe, Md., plant. It will produce canmaking sheets from coils of tin plate and is scheduled for operations by Dec. 1. It will supply scrolled sheets, which are used to fabricate ends for metal containers, to seven Canco plans on the Eastern Seaboard.

The company's first coil center was opened in May, 1957, as the initial step in a $32 million program to reduce costs and improve efficiency. It now buys about 85 per cent of its tin plate requirements in coils and processes them into sheets to canmakers' specifications, an operation formerly performed by the steel mills.

Opens West Coast Plant

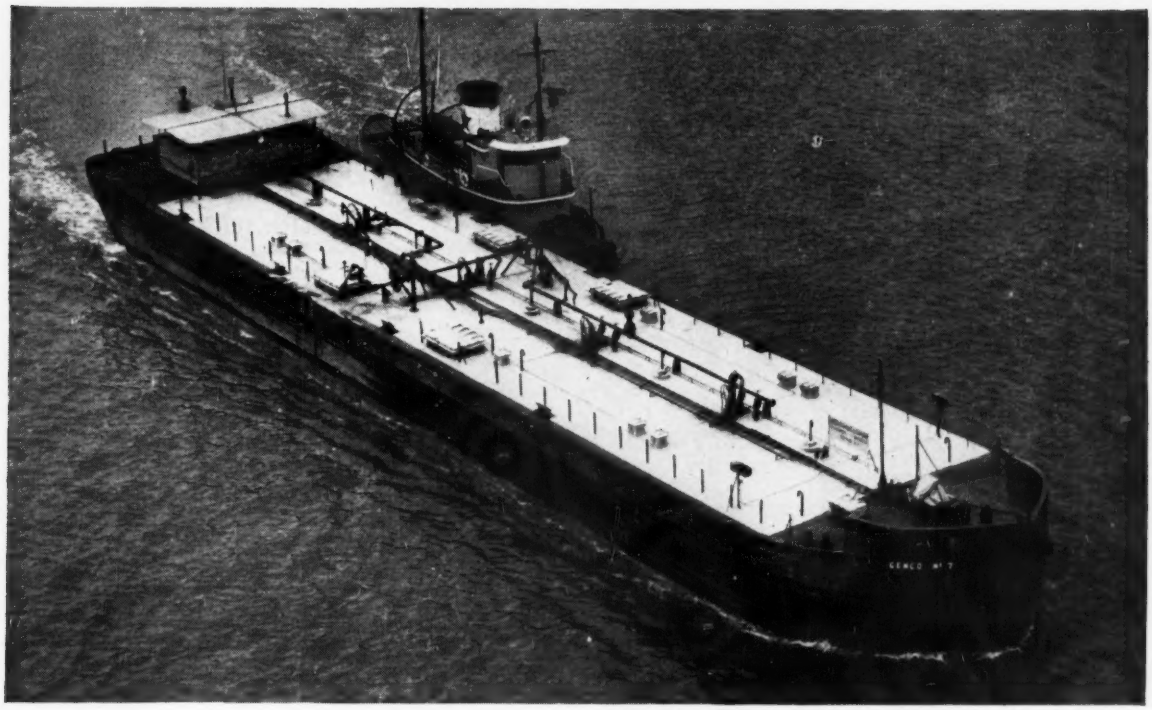
Precision Disc Grinding Corp., Mineola, N. Y., opened a west coast division under the name of Precision Disc Grinding of California Inc., 1044 W. Hillcrest Blvd., Inglewood, Calif. Services of the new facility will include double disc grinding, flat lapping, and other machining.

Enlarges Sintering Unit

Raybestos-Manhattan Inc., Passaic, N. J., is adding 30,000 sq ft to its Wabash Div. plant in Crawfordsville, Ind. The division produces sintered metal products. The construction contract was awarded William F. Lotz Inc., Philadelphia, with completion scheduled for October.

Wah Chang Corp. Expands

Wah Chang Corp. will install a second electron beam furnace at its Albany, Oreg., plant. The furnace, made by Stauffer-Temescal Co., will be capable of melting and casting refractory metals in ingots 5 in. in diameter and 42 in. long. It will be used to meet mounting demand for



Capacity—2000 tons of sulfuric! *The "Genco 7" is the largest in General Chemical's fleet of eight sulfuric acid barges.*

Call on **GENERAL CHEMICAL** for ***Sulfuric Acid*** ...*As you need it!* ...*When you need it!* ...*Where you need it!*

Whether your sulfuric acid requirements are measured in thousands of tons or carboy lots, General Chemical is best equipped to handle your order.

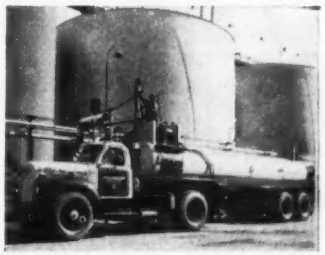
General's extensive network of production facilities plus its large and flexible transportation system assures you of sulfuric as you need it . . . when you need it . . . where you need it!

For example, we have eight sulfuric barges serving customers along the Atlantic coast and on inland waterways. Three operate out of Marcus Hook (Philadelphia), Pa. Two in the New York City area, including the 2000-ton capacity "Genco 7" shown above. Three on inland waterways. General also operates the largest fleets of sulfuric tank cars and tank trucks in the country.

General Chemical has 21 sulfuric plants,* as well as stock points in key industrial centers across the country. Each is geared to meet regional requirements, offering customers the advantages of "next door" location to General's modern facilities. In addition, the output of one plant backs up that of another, making a coast-to-coast supply line which proves invaluable in meeting emergencies or unexpected demands.

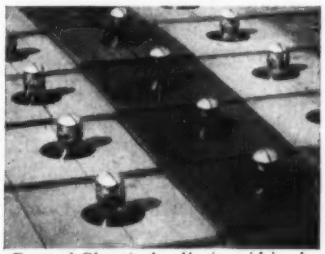
Why not find out how our long experience and extensive facilities can benefit you? For further information, write or phone the nearest General Chemical sales office.

**In Canada: Allied Chemical Canada, Limited*



Large fleets of tank transports provide fast over-the-highway service.

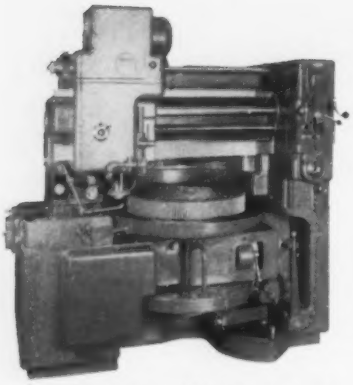
By far the largest fleet of sulfuric tank cars is operated by General Chemical.



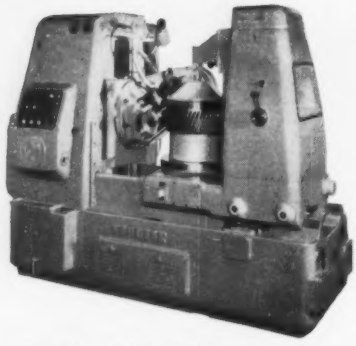
General Chemical sulfuric acid is also available in 13-gallon carboys.

Allied Chemical

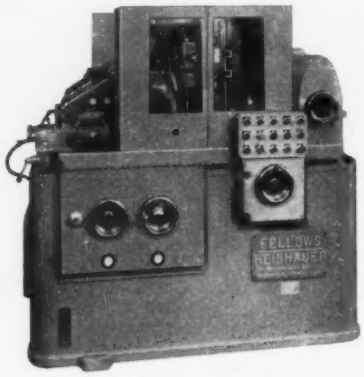
GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.



Fellows Gear Shapers cut internal and external spurs and helicals; capacities up to 120" P.D.



Pfauter Gear Hobbing Machines cut spur and helical gears; capacities up to 120" P.D.



No. 12 Fellows-Reishauer Gear Grinding Machines grind spurs and helicals up to 12" O.D.

COMPLETE COVERAGE

FOR EVERY REQUIREMENT IN MODERN GEAR SHAPING, HOBBING, GRINDING AND INSPECTION EQUIPMENT!

Only Fellows delivers everything you need for modern gear production! No other builder offers as long a line: Fellows Gear Shapers, Pfauter Gear Hobbers, Fellows-Reishauer Gear Grinding Machines, as well as all the Fellows production machine attachments, inspection instruments, and special machines! And that's not all: if your plant has gear production problems we haven't already met in over sixty years of specialization, we'll take solid New England pride in meeting and solving them. Ask your Fellows Representative to show you how new machines from Fellows can help you keep up in the productivity race. Ask him for more information on Fellows service and the full range of gear production and inspection instruments. Or simply write The Fellows Gear Shaper Company, 78 River Street, Springfield, Vermont. Branch Offices: 1048 North Woodward Avenue, Royal Oak, Michigan; 150 West Pleasant Avenue, Maywood, New Jersey; 5835 West North Avenue, Chicago 39, Illinois; 6214 West Manchester Avenue, Los Angeles 45, California.

FELLOWS GEAR PRODUCTION EQUIPMENT

those high melting, corrosion resistant metals in missile and nuclear industries. Wah Chang is a refiner of tungsten, tantalum, columbium, beryllium, molybdenum, vanadium, and their alloys.

Wean Enlarges Facilities

Wean Mfg. Co., an associate of the Wean Engineering Co. Inc., Warren, Ohio, is erecting a 20,000 sq ft addition to its main assembly building to handle the heavier and larger equipment now required by the steel industry. It includes processing line units for steel coils in the 90,000 lb range. The $300,000 addition will increase capacity 40 per cent.

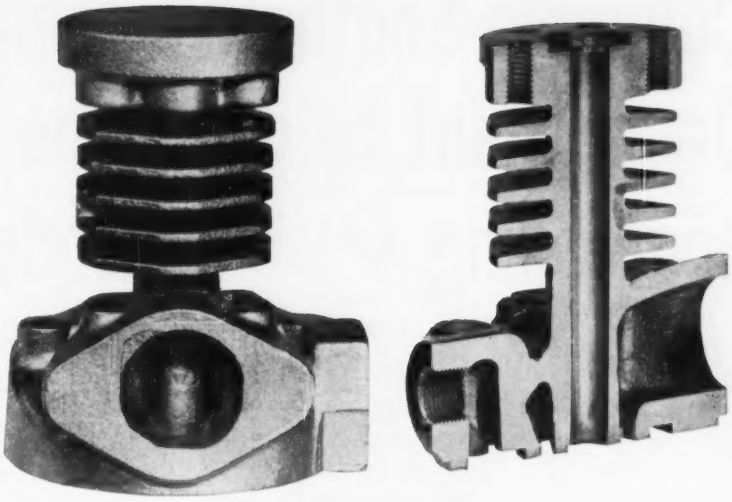
CONSOLIDATIONS

E. W. Bliss Co., Canton, Ohio, and **Gamewell Co.**, Newton Upper Falls, Mass., will merge, subject to approval of stockholders. Bliss makes metalworking presses and rolling mills; Gamewell, police telegraph and radio systems, traffic signals, electrical timing devices, and related items.

Dura Corp. (formerly Detroit Harvester Co.), Oak Park, Mich., purchased **Buch Mfg. Co.**, Elizabethtown, Pa., manufacturer of rolling lawn and garden tools. The Buch property will be operated as a division of Moto-Mower Inc., Richmond, Ind., a Dura subsidiary.

Robinson Technical Products Inc., Teterboro, N. J., acquired High Vacuum Equipment Corp., Hingham, Mass., and will operate the firm as a subsidiary. High Vacuum makes specialized high vacuum, high temperature furnaces and associated equipment.

Rolle Mfg. Co., Lansdale, Pa., producer of aluminum and magnesium castings, has been acquired as a wholly owned subsidiary by **Dek Industries Inc.**, New York. New officers of Rolle Mfg. are: President, R. Carter Dye; executive vice president, Fred H. Edgar; vice president and general manager, W. E. Nolan; and vice president in charge of sales, D. D. Lawson.



PRESSURE TIGHT

A CASE IN POINT—This 8 pound Meehanite Metal casting made for the Joy Manufacturing Co. by Hamilton Foundry is a fourth stage air compressor cylinder. Pressures build up to 6,000 p.s.i. and require a high strength, pressure tight and wear resisting casting. Alloyed Meehanite® oil quenched and tempered, raised Brinell hardness of the cylinder wall to 275-300, and increased tensile strength to 60,000 p.s.i. Meehanite was chosen for this casting because controlled structure and small uniform flake graphite produce pressure tight castings of uniform density and strength.

Meehanite is both an iron—and a controlled process. Through the Meehanite Process the microstructure and the quantity and form of graphite is consistently controlled. This means that a specific type of Meehanite can be selected to meet engineered casting requirements. Testing of every ladle of molten iron insures that specifications will be met in the casting.

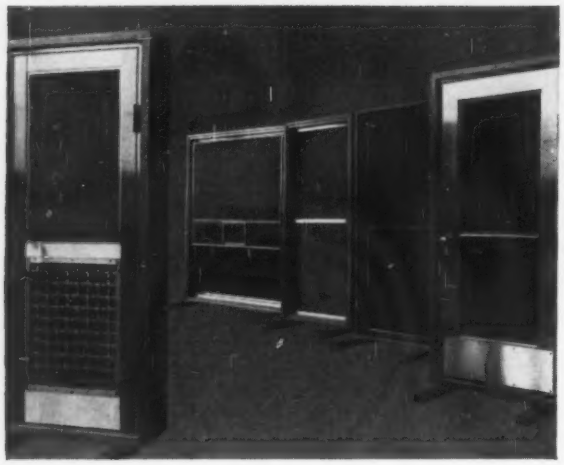
When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

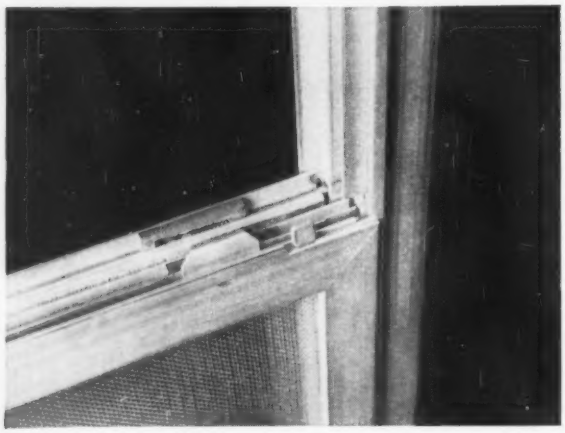
1551 LINCOLN AVENUE • HAMILTON, OHIO • TWinbrook 5-7491

Columbia-Southern's Technical Service Department helped Kane cut their degreasing solvent needs by 30%



Every section of Kane's smartly designed, sturdy windows and doors has to be totally free of grease before painting or shipping.

Kane found that vapor degreasing is the only efficient way to economically clean intricate, precision engineered channels and grooves—necessary features for snug-fitting but smooth-moving window panels.



Kane Manufacturing Company of Kane, Pennsylvania, is a medium sized custom builder of a wide variety of metal screens, door frames, and window frames. Their output has to meet the demanding specifications of highly experienced purchasers, since they equip many institutional buildings—hospitals, schools, government agencies. Many of their orders call for painted parts, and before painting Kane has to be sure that the metal surface is perfectly clean and free of foreign matter. These products are exposed to all sorts of weather, too, and that makes a good—and lasting—paint job even more essential. And most of them have intricate grooves and channels—ideal starting places for rust and corrosion. Also, many of their products are made of aluminum, a material requiring a high-performance solvent.

To make certain they were using their vapor degreasing operation most efficiently, the production people at Kane called in their Columbia-Southern Technical Service Representative. The Technical Service man, working with the Columbia-Southern distributor, Western Pennsylvania Chemical Company, reviewed Kane's set-up and then made specific suggestions. After putting these into practice, Kane found that their operation was improved to the extent that they could handle the same volume of degreasing work using 30% less solvent. The quality of the degreasing was better than ever, and working conditions were considerably improved.

Workers in Kane's degreasing department like the thorough job Columbia-Southern Trichlor does in removing grease and other dirt. Once they have degreased a unit they can get on with the finishing operation in complete confidence. This enables them to set up smooth production cycles, without constant interruption for returning parts that are only partially degreased. And parts come out of the degreasing tank completely dry, so there's no need for a separate, time consuming drying operation. This thorough action means fewer man hours lost for cleaning out the degreasing tanks, too.

Lester Baum (right), Kane's Production Manager, discusses the improved degreasing operation with Ralph Reed, Sales Representative of Western Pennsylvania Chemical Company, who helped with the recommended changes.

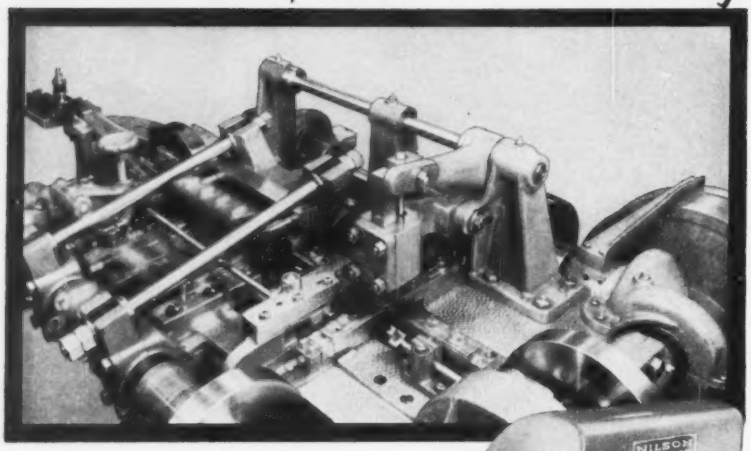
Vapor degreasing at Kane is a smooth flowing operation, and it's finished as soon as parts are lifted out of the tank, because they're completely dry, and ready for the next step.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

A Subsidiary of Pittsburgh Plate Glass Company • One Gateway Center, Pittsburgh 22, Pennsylvania

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston • New York • St. Louis • Minneapolis • New Orleans • Dallas • Houston Pittsburgh • Philadelphia • San Francisco. IN CANADA: Standard Chemical Limited

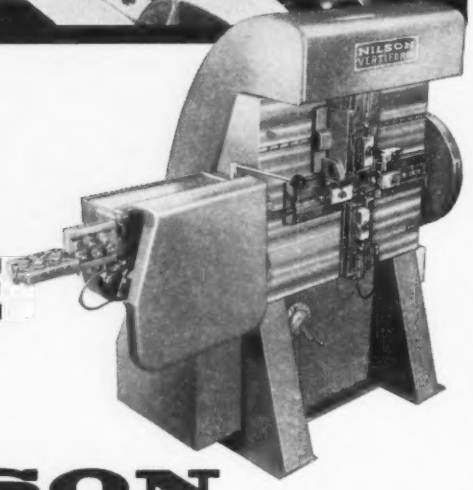
NILSON 4-SLIDES FORMING PRODUCTION PROFITS... *Automatically*



WHY

Cost-Conscious Companies

CHOOSE A NILSON



Illustrated at top is Model S-1-F Machine, showing built-in press and open construction of forming area. Directly above is the new Vertiform Machine.

Every Nilson 4-Slide Forming Machine is designed with built-in flexibility! Most models handle either wire or ribbon metal with equal speed and accuracy . . . can combine stamping, welding and other secondary operations with the basic forming cycle. Easy access to tooling insures rapid setups, minimum down-time for job changeovers.

Whatever your forming application, there's a Nilson 4-Slide to do the work faster, more economically! With 17 horizontal models and the new "Vertiform" machine, Nilson offers you the widest selection of 4-slide equipment.

Investigate the cost-cutting advantages of Nilson 4-Slides in your operations! For a production evaluation of your parts, send prints or samples today.

See these machines in operation at the ASTE Show, Booth 1817

SIZE RANGES:
Wire up to ½" diameter
Ribbon stock to 3½" wide
Feeds up to 32"
5 TO 75 TON
PRESS SECTIONS

NILSON
THE A. H. NILSON MACHINE CO.
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AUTOMATIC WIRE & RIBBON METAL FORMING 4-SLIDE MACHINES • WIRE & STOCK REELS • WIRE STRAIGHTENING EQUIPMENT • AUTOMATIC STAPLE FORMING MACHINES • SPECIAL WIRE FORMING EQUIPMENT

Coming Oct. 12

Management In Transition

Are you getting the maximum effectiveness from your staff-line relationships? Does your organization chart align chain of command as well as it does responsibility?

Operating a business enterprise is growing in complexity—the role of the individual manager is getting more complex. And that has been a major factor in the "generalist vs. specialist" conflict in many firms. Eliminate that conflict and you'll increase your over-all managerial performance. STEEL's next Program for Management article will give some suggestions for combating the problem.

Articles in the series published to date:

1. **Profile of Metalworking's Managers (Feb. 16, p. 137).**
2. **Improving Productivity (Mar. 16, p. 103).**
3. **Keeping Wages in Line (Apr. 13, p. 95).**
4. **Giving More Public Service (May 18, p. 99).**
5. **Meeting Foreign Competition (June 15, p. 131).**
6. **Keeping Pace with Technology (July 13, p. 95).**
7. **Increasing Research, Development (Aug. 17, p. 87).**
8. **Improving Marketing (Sept. 14, p. 153).**

An extra copy of these Program for Management articles is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

THE CHANGING ROLE OF METALWORKING MANAGERS

Improving Marketing

YOU WOULDN'T think of manufacturing your product without one or more quality control steps. So why depend upon sheer drive, intuition, and guesswork in your marketing?

That philosophy is rapidly taking root in metalworking. It has many labels, including total marketing, the marketing concept, full-circle marketing, and integrated marketing.

Its chief characteristic is a 180 degree twist in corporate emphasis: It moves from "here's a product; let's take it to the consumer and sell it," to "let's go to the consumer and see what we can sell profitably; then we'll make it."

No other management innovation has had so great an impact on the changing role of today's manager. Its influence is being felt on all major functions—administration, engineering, manufacturing, purchasing, and sales.

The key ingredients of the new approach are: The proper management attitude, good organizational structure, effective market research.

D. L. Leonhard, a consultant for George Fry & Associates, sounds this warning: Without planned marketing, you place yourself in the position of a poker player hoping for a lucky draw. You're practically defenseless against a competitor who handles marketing strategy with the finesse of a chess player.

Marketing's Basic Factors

Take a look at the basic factors forcing more emphasis on marketing:

1. **The stepped-up tempo of change in our economy.** Markets cannot be taken for granted — change is one of the constants of our age. Some 60 per cent of today's consumer products either did not exist in 1950 or have under-

Marketing Gains As a Tool For Managers

ELMER GUSTAFSON

Vice President-Sales & Marketing
Ceco Steel Products Corp.

"Styles and tastes in architecture change constantly—they also vary considerably from one geographic region to another. Add changing local competitive conditions and you have the ingredients for Ceco's marketing problems. Our eight regional managers play a major role in our program."

gone radical change. Consumers shift their preferences rapidly—aluminum has dug big inroads into markets once exclusively held by steel and wood. Air travel is dominating the transportation spotlight. The giant strides in changing technology pose both market threats and opportunities.

2. Increasing complexity of distribution. The problems emerged for makers of consumer products with the rise of supermarkets, variety stores, and discount houses. Manufacturers of industrial products are also having their troubles. In looking for diversification markets and products, they are discovering that distribution is often their number one obstacle. Geographic shifts in markets are also affecting distribution.

3. Increasing need for better sales forecasts. Capital investment requires decisions based on sound long range forecasts. Pricing strategy and profit planning depend upon accurate short term sales forecasts.

Importance of Attitude

All executives contacted by STEEL echoed the sentiments of Carl Sadler, group vice president at Sundstrand Corp. "There's no magic button you can push to accomplish the transition to the marketing concept overnight. The marketing attitude must begin with top management. It must recognize the need for it—in our situation we wanted to set up an aggressive plan of diversification. The so called marketing concept seemed to provide the logical starting point."

H. Herbert Pfeifer, manager of sales promotion and advertising at Chain Belt Co., stresses the need for "the attitude" this way:

"Business today can have no Jim Crow cars with engineering and manufacturing people sitting in one part . . . with the selling organization in another . . . with sales on one side and advertising and sales promotion on the other. Or, for that matter, the buyer at one end of the car and the seller at the opposite end."

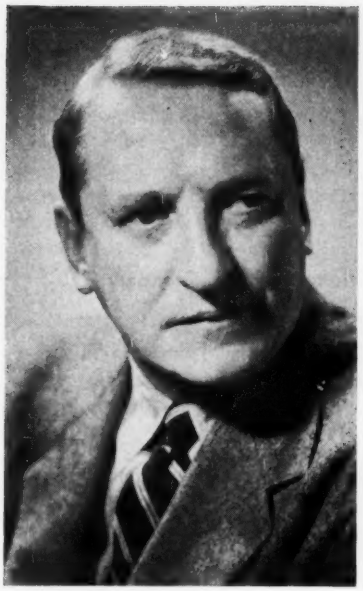
You can spot the firms that lack the right attitude regardless of how their organization chart is drawn. Here are two ways:

- Engineering - oriented concerns bring out many new products and packages conceived and engineered strictly in the laboratory. Sales failures are the rule until customer feedback has resulted in many changes. Sometimes the product fails to get off the ground; often the competition has ample opportunity and time to come up with something of its own.
- Lack of consumer research, particularly when the company is several steps removed from the customer via jobbers, distributors, or retailers. Blame for sales failure generally goes to the middlemen. You don't have to look too hard for many examples of companies that spend substantial sums for product research and development, internal cost reduction programs, and new plant and equipment but make only token outlays for market research.

How to Start

Many firms find that easing into the marketing concept is the best approach. A transition similar to that at Acme Steel Co. is common. "Expansion necessitated a better backing up of the field organization," relates G. Findley Griffiths, executive vice president-commercial.

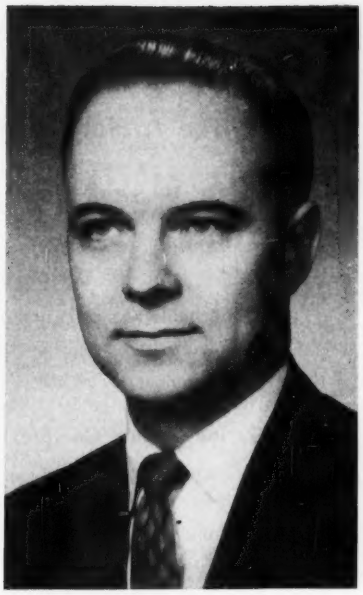
"We had no formal sales training, program, no market research. Advertising was handled by the assistant to the president."



G. HERBERT PFEIFER

Manager Advertising & Sales Promotion
Chain Belt Co.

Marketing has to do with people—both inside your organization and out. I like to think of the advertising and sales promotion manager as the catalyst for bringing all the marketing functions into a single entity with concentrated firing power.



A. JOHN WARD

Manager Marketing Planning
Aviation Div., Sundstrand Corp.

Industry has greater capacity than demand for its products. Production techniques are no longer small-group secrets. Engineering talent and creativity migrate throughout industry. Tomorrow's big challenge is success in new products and in new market activity.

G. FINDLEY GRIFFITHS

Executive Vice President-Commercial
Acme Steel Co.

Like many metalworkers, a formal marketing program is relatively new to his organization. "It took a while for production and engineering-oriented managers to learn what this approach could really do," says Mr. Griffiths. "The advantages of systematized marketing are now showing up."

Acme's marketing services activity was started in 1954 under the direction of James Borendame. Today 36 people are working with him in these activities: Market research, advertising and sales promotion, sales training, sales analysis, sales forecasting, pricing and profit evaluation studies.

About a year ago, Acme Steel got its first vice president of marketing, Joseph H. Myers, who moved into the spot from production. The change permitted the company to separate many staff functions from direct selling activities.

Another key step in Acme's program was the formation of its Development Committee. Members include Mr. Myers, the heads of Acme's three product divisions, the director of the New Products & Improvements Div., the chief engineer of tool and machine design, and the superintendent of manufacturing. The committee screens new product and market ideas and appropriates development funds.

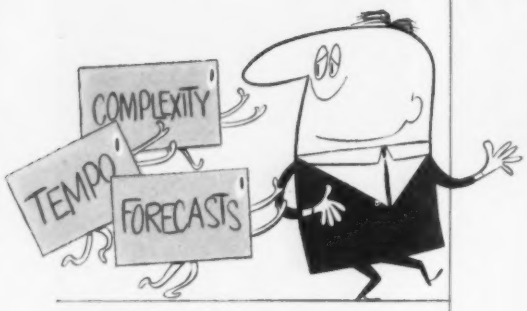
Such committees are a more distinguishing feature of firms embracing the concept than the market-oriented organization chart—particularly in the medium and small size firms where the marketing manager function may be under control of the executive vice president or president.

One of the objectives is to free the sales executive of total responsibility for some of the staff functions and long range planning so that he can devote more energy to immediate sales goals. The integration of all functions that marketing requires is done by the planning committees.

Sundstrand Corp.'s Aviation Div. recently formed a New Products Planning Committee which has the basic responsibility for the long range plans of the division. Members include the group vice president (head of the aviation and defense products divisions), group director of marketing, division manager, division marketing manager, chief engineer, and manager of market planning.

Chain Belt Co.'s marketing council has these members: Vice president-marketing, division sales managers, market analyst, supervisor of distributors, export, market development, trade relations, and sales promotion and advertising managers, plus the firm's advertising counsel.

"While the members have always been co-operative with each other, the council has provided the opportunity for a meeting of the minds and interchange of ideas and experiences," says Mr. Pfeifer. "We don't have any rushing ahead to market a product because an engi-



Three factors behind . . .

The Need for Marketing Concept

1. Stepped-up Tempo of Change in our Economy

Technology is changing rapidly.

Personal consumption has almost doubled since 1947.

Consumer preferences shift rapidly.

2. Increasing Complexity of Distribution

Supermarket and discount-type retail stores have come into their own.

Both industrial and consumer markets have shifted geographically.

Companies are putting increased emphasis on diversification to broaden product lines and enter new markets.

3. Need for Better Sales Forecasts

Capital investment, particularly for automation, requires more accurate, longer range forecasts.

Pricing strategy and profit planning depend upon better forecasts.

Impact of foreign competition is increasing.

neer develops something and the divisional sales manager thinks it's good. The product and idea are presented to the marketing council for discussion and recommendation on:

"Should it be packaged? Is it a distributor or direct sales item—or both? Do we know the market and the consumer buying tendencies? Is market research indicated? How should it be priced? What advertising and sales promotion are required? What type sales training is needed? What are the competitive factors?

"Many things which may have been treated lightly in the past are now thrashed out by the council. Co-operation and understanding of each other's problems have paid off."

The Man of Marketing

What type individual should the marketing manager be and where do you get him? Mr. Leonhard of George Fry & Associates says studies indicate that only in rare cases can a successful sales manager become a successful marketing manager. "This is not a derogatory description of the sales manager," he hastens to add. "One expects the sales manager to be order-getting minded and concerned about a steady flow of revenue. The successful sales manager is a doer—he puts on the dog and pony show; he motivates his men by transferring his enthusiasm to them; he rides herd on them if sales falter.

"But the marketing manager should be of a different breed. He may have come up through sales—but it's a mistake to require that background. The marketing manager is by nature a planner, administrator, and co-ordinator. Here's a basic difference: The marketing manager is more concerned with company profits over the long range than with actual sales volume."

Backstopping with Research

The creation and development of the proper attitude and organization must be implemented with good market research for maximum effectiveness. Research is the marketing activity's quality control tool. Compared with product research, it's relatively new, and its potential is practically unplowed ground.

The tests, measures, and evaluations begin with the user or consumer and travel a complete cycle through manufacturing and sales back to the consumer. Market research has three important levels of activities:

1. It determines whether a product idea is acceptable to the consumer, what features he'll need, what will appeal to him, and what price he'll pay. And most important, can the company make the new product at a profit?

2. In mapping out the sales strategy, marketing research pinpoints the consumer's location and how best to sell and deliver the product to him.

3. As the marketing activity begins to reach its full cycle—back to the customer—research helps highlight the strengths and weaknesses of the total program.

Let's look at some examples of marketing in action.

Marketing at Chain Belt

The cement industry—like most industries—emerged from World War II with tremendous pent-up demand in its favor. By 1950, the economic signs were in big, capital letters—demand could only increase with the housing boom, industrial expansion, highway program, and other construction.

The industry, already operating at capacity, had to expand. It was also having equipment problems because of the high level operations —one in particular, bucket elevators. The elevators, which handle the raw materials of cement, were wearing out too fast; maintenance costs were high; and the industry was pressing for increasing output.

Sales engineers for Chain Belt spotlighted the problem. At first glance it looked like it was strictly in engineering. But the need for action by practically all management functions made it a "marketing" problem.

Chain Belt's research and development and engineering personnel teamed up with field sales managers and sales engineers. They talked with all major cement firms—their administrators, engineers, operators, maintenance men. All complaints were investigated; operational data were studied; and parts which failed were collected. That was the technical side.

Market research asked: How many cement mills are there? How much can Chain Belt afford to spend to develop better bucket elevators? What's the competition doing? Since time is important, what's the best way to present a development to the industry in the shortest possible time?

The product development proved successful. Chain Belt conducted symposiums on bucket elevators for key personnel in the cement mill centers of the nation. Reports Mr. Pfeifer: "Our timing matched the timing of the cement industry's greatest expansion and modernization program in history. We count among our customers almost all the cement firms in the country."

Marketing at Micro Switch

How can you help your salesmen do a better job? That's one of the continuing headaches of sales managers. On Page 159, Micro Switch outlines its approach to gain a useful sales territory comparison tool. The company lists about 50,000 firms as customers and prospects. It took A. W. Wacaser, manager of market research, and his staff about a year to develop the breakdown.

How did the sales people feel about it? "There were obviously some reservations," says F. E. Wilsey, sales manager. "But the usefulness of the tool is becoming more and more apparent—we can help the salesman pinpoint new prospects; we'll be able to spot areas where more promotion is needed; we'll be able to spot and correct our personnel problems; we'll be able to determine our sales training requirements."

Marketing at Sundstrand

Because good marketing starts with the consumer, it's a logical step to assign marketing the responsibility for collecting and screening new product ideas. It's one of the responsibilities of A. John Ward, manager of market planning at Sundstrand Aviation. He's also chairman of the division's New Products Committee.

"We organized the committee early this year," he states. "And our first objective was to get some ideas into the pipeline. Here's how we did it. First, we polled all salesmen and certain individuals within the company who are closest to applications and customers. Then I talked at various department meetings about our market planning activity and how each individual is a member of the marketing team. The two steps brought out a host of ideas.

"We wanted some from the outside, too, and decided that one of the best places to go would be to professional researchers who deal in ideas. At Battelle Memorial Institute, we surveyed their creative people. It was like opening a feather pillow.

"Those steps gave us an abundance of ideas to start with. The New Products Committee has spent most of its time just classifying them. To us, there are no bad ideas—we classify them this way: 1. Current interest, under investigation and active study. 2. Interesting idea, needs more information —technical or marketing. 3. Deferred for periodic—other ideas have priority at the moment, so we'll check later. 4. Inactive—the idea was considered and disposed of.

Marketing at Shakespeare

Aggressive marketers are looking at distribution. Most thoughtful

How Much for Market Research?

Less than 1 Per Cent of Sales

Sales in Millions	Median % of Sales
$5 to $25	0.21
$25 to $50	0.10
$50 to $100	0.06
$100 to $200	0.043
$200 to $500	0.025
Over $500	0.028

Source: American Marketing Association's survey of expenditures by 231 industrial product manufacturers.

What Kind of Market Research?

The Activity	% of firms doing it*
MARKET & SALES	
Development of market potentials	88
Share of market	85
Market change studies	69
Setting sales quotas	72
Establishing sales territories	75
Distribution method and cost studies	52
Export markets	41
BUSINESS ECONOMICS	
Short range forecasting	86
Long range forecasting	80
Business trends	79
Profit analysis	60
Forecasting of personnel requirements	44
PRODUCT RESEARCH	
New product potential and acceptance	83
Present product vs. competitors'	82
Research on competitors' products	66
"Length of line" studies	41
Packaging, design, or physical characteristics	40
ADVERTISING RESEARCH	
Motivational research	21
Copy research	37
Media studies	46

Source: American Marketing Association.
*Firms with formal market research departments.

executives feel that too little money has been spent on research to cut distribution costs. Why must the selling price be double or more the product cost—no value has been added!

E. R. Hames, general sales manager of the Shakespeare Co., cites six factors which are tending to make the retailer and manufacturer gravitate toward other modes of distribution.

1. Rapid transportation. 2. Self-service. 3. Brand name consciousness. 4. Effective national and local advertising. 5. Packaging. 6. Competitive demands to be first to offer new merchandise.

Shakespeare is in an industry that traditionally has sold primarily through jobbers and wholesalers, yet nearly 60 per cent of its volume goes direct from factory to retailer.

Marketing at U. S. Steel

U. S. Steel Corp. has been a leader in another approach to the modern marketing concept—selling your customer's customers to boost your sales. "Operation Snowflake" is an example. (Giving appliances for Christmas is promoted.) U. S. Steel does not manufacture appliances—but its customers do.

"There are three levels of decisions with which we're concerned," says Bay Estes, vice president-marketing. They are:

1. The decision to buy something that can be made of steel.

2. The decision to buy the product of steel — rather than copper, aluminum, plastic, or wood.

3. The decision to buy the steel from U. S. Steel, not its competitors.

Marketing at Ceco

Many industrial marketing problems are similar. Ceco Steel Products Corp., for example, has a styling and customer preference problem for its residential, industrial, and commercial building products. "Styles in architecture are changing constantly," says Elmer T. Gustafson, vice president-sales and marketing. "In Cincinnati, for example, there may be a trend for several months with casement windows getting most of the play in construction. Almost overnight, the trend may shift to double-hung

Micro Switch Developed a Sales Territory Comparison

Industry—SIC	Number of Plants	Number of Employees	Sales per Employee	Sales per Employee of 2nd Highest Territory
Electrical control apparatus—3616	40	11,000	$28	$41
Motor vehicles & parts—3717	32	8,432	$33	$30
Pumps & compressors—3561	16	1,600	$16	$22

Using STEEL's book, *Metalworking Markets in the U.S.A.*, Micro Switch Div. of Minneapolis - Honeywell Regulator Co., analyzes the sales of each of its 21 field offices. It breaks down sales by plants in their SIC classification and by number of employees. It uses the sales figures of the second highest territory, rather than the top one, as the target.

A. W. Wacaser, manager of market research, comments: All territories are high in some classifications, low in others. The over-all sales volume of a territory or an individual doesn't necessarily indicate high or low performance. We feel that by knowing the number and kinds of plants in a territory and the sales per employee, we have a useful marketing tool for:

1. Helping the salesman discover prospects in his territory he didn't know existed.

2. Assisting management in determining personnel requirements in sales territories.

3. Highlighting industries and territories where marketing efforts should be increased or decreased.

4. Helping to pinpoint sales training requirements.

windows or sliding windows. In another city or region the situation may be the exact opposite. The steel vs. aluminum preferences also shift from region to region.

"How do we approach the problem? Our regional managers play a key role in our marketing strategy. Each quarter we have a general meeting in which the trends are discussed and evaluated so that we can schedule production accordingly.

"We're finding this problem too: Changing local competitive conditions. We frequently find that a local plant may spring up and offer us price competition on certain products—because of shipping costs. When that happens, we may shift emphasis from one product to another. We work hard on profit objectives, and when one item doesn't measure up in a certain area, we drop it and concentrate on another which does bring in the desired profit."

Count More than Noses

Most marketing research, particularly by the makers of industrial products, has been of the statistical, nose counting variety. But like their consumer product counterparts, they're beginning to research customer attitudes and preferences at the "subconscious" level.

One of the well known and often controversial researchers in this field is Louis Cheskin, director of the Color Research Institute. "People are still human," he emphasizes, "and as such are subject to emotional as well as rational factors. Our tests demonstrate time and again that when you approach them directly, their responses will reflect a desire to impress you that they're intelligent, practical, and rational." STEEL's new study on the "Emotional Factors that Trigger Industrial Sales" (STEEL, Apr. 6, p. 104) also proved that the industrial buyer is human.

The implications are obvious. Market research must go beyond nose counting if the maximum effectiveness is to be realized. The extra step involves why and how a thing happened, as well as to whom, how many, and when.

Corporate and brand image studies are recognition of the need for more penetrating research. Standard Screw Co. has three divisions—Chicago Screw Co., Hartford Machine Screw Co., Western Automatic Screw Co.—each of which used to market its own fasteners. About three years ago, a brand image study indicated that competitors who marketed on a national scale had better "name recognition" among fastener users than the divisions of Standard Screw.

To overcome that problem—and also realize some manufacturing and sales efficiencies — Standard Screw switched to a national marketing program and adopted the brand name of Stanscrew for its fasteners. The national marketing program is now administered from Chicago by E. L. Claussen, vice president, Standard Products Div. Fas-

teners are marketed under the name of Stanscrew, regardless of the plant in which they're made. This permits all sales promotion and advertising programs to be co-ordinated on a national scale.

Successful marketing depends upon the consumer's image of your company. The ingredients are your products, advertising, public relations, and company personnel—all the way from the president to salesmen, distributors, and field servicemen. It's difficult to ascertain what that image is; it's even more difficult to uncover the factors which created it. And once they are determined, it often takes considerable time to build the image you want.

Across the Board

Marketing is not a specialized activity in the way you would describe purchasing and production. It's a major role in the function of every metalworking manager. But the activities must be co-ordinated on a top management level because the objectives are basically long range:

1. What products for opportunity?
2. What markets for growth?
3. What price and cost for profit?
4. What timing for success?
5. What promotion for success?

As a company, how's the "quality control" of your marketing activities?

As an individual manager, what are you contributing to your firm's market planning?

One of the newer tools of marketing...

Motivational Research Highlights Some Trends

Louis Cheskin, director of the Color Research Institute and author of *Why People Buy*, is a frequent critic of the auto industry. Shortly after the introduction of the Edsel, he predicted that it would not be a sales success. He predicts that the compact car will have only minor impact on the sales of foreign cars. He's also predicting that in a few years the auto industry will have only four models—the compact car, sports car, station wagon, and luxury types.

He bases his prognostications on trends appearing in motivational research (on the subconscious level) he is doing. Here are some of his findings:

1. The consumer is becoming more sophisticated in his buying habits. He has become more aware of function and performance. He no longer associates quality strictly with luxury and high price.

Example: Both the auto and refrigerator makers have convinced the buyer that its low price lines lack only luxury features, that over-all quality is the same. So there's a definite trend away from the middle price refrigerators toward the luxury and low price lines.

2. In design—the trend toward greater preference for rounded and curved forms (vs. sharp, angular, and pointed forms) is increasing.

3. Colors—studies in the last two years show:

- **Muted colors are gaining popularity.**
- **Preference for true two tones (such as blue and light blue) is increasing over two color combinations.**
- **Consumer preferences differ by income group—higher income groups prefer deep textured browns, reds, black, and white; middle income consumers prefer aqua greens, turquoise blues, natural straw; low income consumers favor bright greens, oranges, yellow.**

This is a foreman dressing for work!

Time was when Pete wore the grubbiest work clothes he could find. He *had* to—with all the trouble-shooting he did. And as production fell behind he sometimes even had to fill in on a machine. What a waste of a good foreman!

Today, you'll find Pete in a white shirt—and tie. No longer does he do other men's work. Now he's the real right hand his management needs and wants.

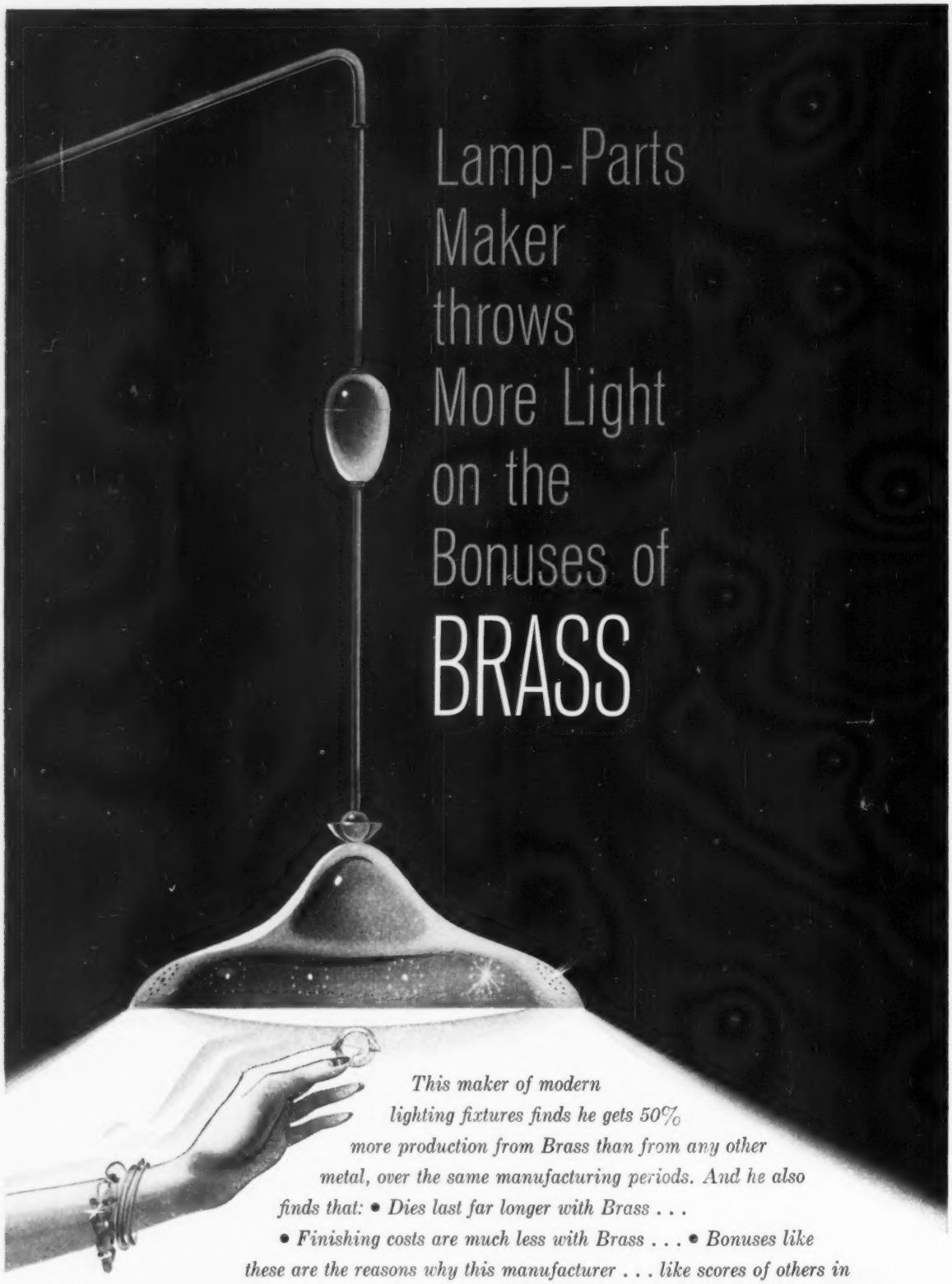
Automatic Keysort Data Processing made the difference! Automatic Keysort now helps Pete and his management plan *in advance*, reports performance at every stage. Man-hours are used more profitably... and experienced foremen like Pete are free to concentrate on supervision, work assignments, production flow. Without extra bookkeeping, without having to pitch in themselves.

Automatic Keysort's easy-to-use machines and punched cards require no specialized personnel, no restrictive procedures. Designed to fit your business as it stands and as it grows, Keysort will give you all the fast, accurate information you need for modern management control of every factory operation. And at remarkably low cost.

To learn more about how Automatic Keysort Data Processing can fulfill *your* needs for timely, comprehensive facts and figures, call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y., for brochure FS-33.

ROYAL McBEE · *data processing division*

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION



This maker of modern lighting fixtures finds he gets 50% more production from Brass than from any other metal, over the same manufacturing periods. And he also finds that: • *Dies last far longer with Brass . . .* • *Finishing costs are much less with Brass . . .* • *Bonuses like these are the reasons why this manufacturer . . . like scores of others in other fields . . . stay with* **BRISTOL BRASS STRIP**

The **BRISTOL BRASS CORPORATION** *Since 1850, makers of Brass strip, rod and wire in Bristol, Connecticut. Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse*

AND FOR BRASS FORGINGS, TOO . . . ACCURATE BRASS CORP. (SUBSIDIARY OF THE BRISTOL BRASS CORP.), BRISTOL, CONNECTICUT

Technical Outlook

September 14, 1959

RECORDER AIDS TIME STUDY— Arc time recorders make permanent records of how much machines (welders, lathes, grinders) operate during an 8 hour shift. They also record the amount of current used—a useful method of checking weld or machining quality against specifications, states Arcair, Lancaster, Ohio.

REVISE TAP STANDARD— Latest cut and ground thread tap standards have been approved by the American Standards Association and the American Society of Mechanical Engineers, New York. Standards instituted by the societies in 1955 are spelled out in *American Standards Taps* (B5.4-1959), published by ASME.

NEW WAY TO USE JET POWER— Take a jet engine, hook it to a gas turbine, and connect that to a centrifugal compressor. The exhaust of the jet drives the turbine and compressor. Result: Amazing operating economy in pumping natural gas through transmission lines. A prototype is being made by Cooper-Bessemer Corp., Mt. Vernon, Ohio.

POLARIS GETS NEW ROLE—Our navigational satellite program (Project Discoverer) will get its boost from Polaris missiles which will put a 50 lb payload into orbit, say Navy sources. It was recently tested successfully in a surface firing from a Naval vessel.

SHOCKPROOF BATTERY— Permanently rechargeable nickel-cadmium batteries (chiefly for rockets and missiles) are being made to resist shocks in excess of 2000 Gs. They are made in practically any shape to fit into odd corners, says Gulton Industries Inc., Metuchen, N. J.

MORE HEAT RESISTANT STEELS— Various combinations of vanadium, columbium, tungsten, and molybdenum give certain heat treated, austenitic alloys room and high temperature properties and creep rupture strengths which compare favorably with those of superalloys like A286 and Inco 901. Such materials can also be rolled. Tests at Crucible Steel Co. of America, Pittsburgh, are discussed in PB151558 which you can get from OTS, Department of Commerce, Washington 25, D. C. ($2.50).

START ON GAS-COOLED REACTOR— Philadelphia will get 40,000 kilowatts of new electrical capacity in late 1963 via a helium-cooled atomic reactor. The Atomic Energy Commission has signed a contract for construction with the Philadelphia Electric Co., and General Dynamics Corp., Groton, Conn. The plant will operate at higher, more efficient temperatures than today's and is expected to speed up the advent of economical atomic power.

EASIER BATH DISPOSAL—A new organic additive for pickling baths makes it easy to flush waste materials down regular drains without further treatment, claims Baker & Gubbins Co., Detroit. It's a neutralizer and sequestering (separating) agent which remains red until spent, when it becomes colorless. Residual film on steel prevents corrosion up to ten days indoors.

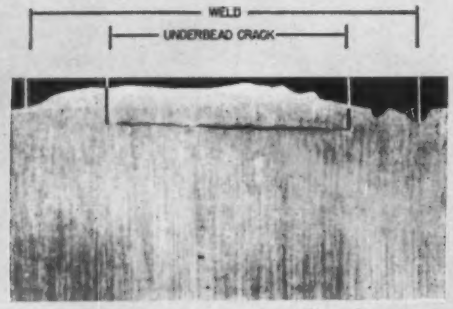
COMBINES HEATER, FREEZER—The Navy has asked Westinghouse to build a single unit (capacity, 1 ton) which will thermoelectrically both heat and cool air and refrigerate or freeze foods on ships. Dr. S. W. Herwald, vice president-research, Westinghouse Electric Corp., Pittsburgh, says the unit will have three components which can be operated independently.

OUTSIZE MAGNET IS PUMP PART—One of the largest Alnico V magnets ever made (1720 lb) will help pump liquid sodium in a reactor at Argonne National Laboratory, Lemont, Ill. It resists 750° F, making possible the circulation of liquid sodium by magnetic action alone (the pump has no moving parts).

The A B C of Welding 'T-1' Steel

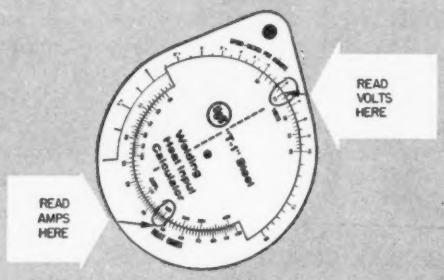
A Electrode . . .

Applying low hydrogen electrodes will eliminate underbead cracking. Another point: When matching "T-1" to other steels, match rod strength to the lower of the two



B Heat . . .

Don't overheat, or you will destroy its heat treated properties. This welding heat input calculator enables operator to vary machine settings, prevent excess heating



WELDABILITY is one of the key properties of "T-1" steel, but some users have claimed it is a mixed blessing. They have reported that welds tend to crack or lose their strength. The producer, U. S. Steel Corp., says the answers are found in three simple rules:

1. Use the right electrode.
2. Don't overheat the metal.
3. Use the correct welding procedure.

The rules pick up added significance by making it possible for more users to take advantage of the material, particularly in applications that make structures lighter and stronger. For example, shovels made of "T-1" can last longer and lift more than those made of other materials, both benefits which more than offset the initial outlay. (The material costs about two and a half times more than regular steels.)

U. S. Steel looks for a pickup in demand. It will double its "T-1" heat treating capacity next year. New equipment going in elsewhere during 1960 will bring industry capacity (now about 130,000 tons annually) up to 200,000 tons.

Here are the rules:

• Hydrogen is enemy number one. It's a matter of using the right electrode, U. S. Steel says.

Proper welding of "T-1" depends most heavily on keeping the hydrogen down in both electrodes and base metal. Under extremely high welding heats, hydrogen bubbles form in the weld metal. They can escape near the surface but down near the root, metal chills and hardens rapidly, trapping the gases. Freezing metal produces enormous pressures, causing underbead cracks.

To get around the problem, low hydrogen electrodes (shipped in sealed cans) are used. After the cans are opened, the rods are usually kept in closed ovens at 250° F.

The importance of keeping moisture out of the rods is illustrated by this report: An eastern fabricator couldn't stop weld cracking. A U. S. Steel consultant investigated.

"Are you keeping your rods dry all the time?" he asked.

"Sure," said the operator, pointing to the oven.

The consultant looked. A pot of coffee was being brewed on the rods. More than enough moisture was being produced to raise havoc.

Another note: When matching "T-1" to other steels, use electrodes which match the tensile strength of the lower one.

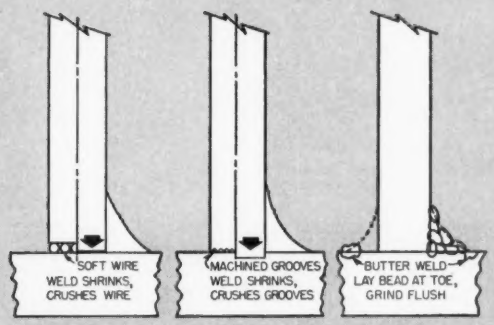
• Rule two prescribes a correct temperature to control tensile strength of welds.

Welding generates 11,000° F. With all that heat concentrated in one area, most welders like to preheat steel alloys to prevent internal strains. In addition, welded joints

These rules will eliminate the bugs in joining this popular low alloy steel, asserts U. S. Steel. They eliminate cracking and preserve its physical properties

C Procedure . . .

Correct procedure involves using stringer beads, heatless back chipping, and speed control. Here are three more suggestions which will improve fillet welds and eliminate cracking



in most steels are improved by higher amperages and voltages during welding (it lengthens the time it takes a weld to cool).

Those practices don't apply to "T-1." Good welds depend on not exceeding a definite maximum heat input, plus rapid cooling. You never preheat "T-1" except under unusual conditions—and generally with the advice of a specialist.

• Welding machine settings are easily calculated with a handy little circular slide rule which you can get from U. S. Steel.

It's fairly easy to keep heat under control. Input depends on these factors: Voltage, amperage, and the speed the arc travels along a joint. Pick them incorrectly and you're apt to get a weld that's too brittle.

Only two other factors need to be watched—plate thickness and temperature. Thicker plates soak up more heat than thinner ones. Also, if you've been doing previous work on the plate and it's already warm, you'll have to make adjustments.

• Rule three: Use the correct welding procedure.

Many operators like to weave the electrode back and forth while welding. "Don't!" shout the experts. A straightforward stringer bead puts less heat into the metal yet makes a satisfactory weld. Several stringer beads will cover a large area.

Another practice for high class welding — back chipping — should be done with manual methods — powered chipping hammer, grinder, or arc-air gouge. An oxyacetylene torch is *verboten*.

A good fillet technique is also quite important. As in any type of welding, an operator ought to avoid undercutting, poor contours, bad roots, and toe cracks.

• Welding is often the only way to harness the high strength and toughness of this steel.

The early problems were never really difficult to overcome. They became problems because the basic rules, although simple, seemed to run contrary to common welding sense. For example, most people know it's good practice to preheat and use higher voltages and currents to improve weld quality. Not so with "T-1." Too much heat destroys the improved properties you get with rapid cooling.

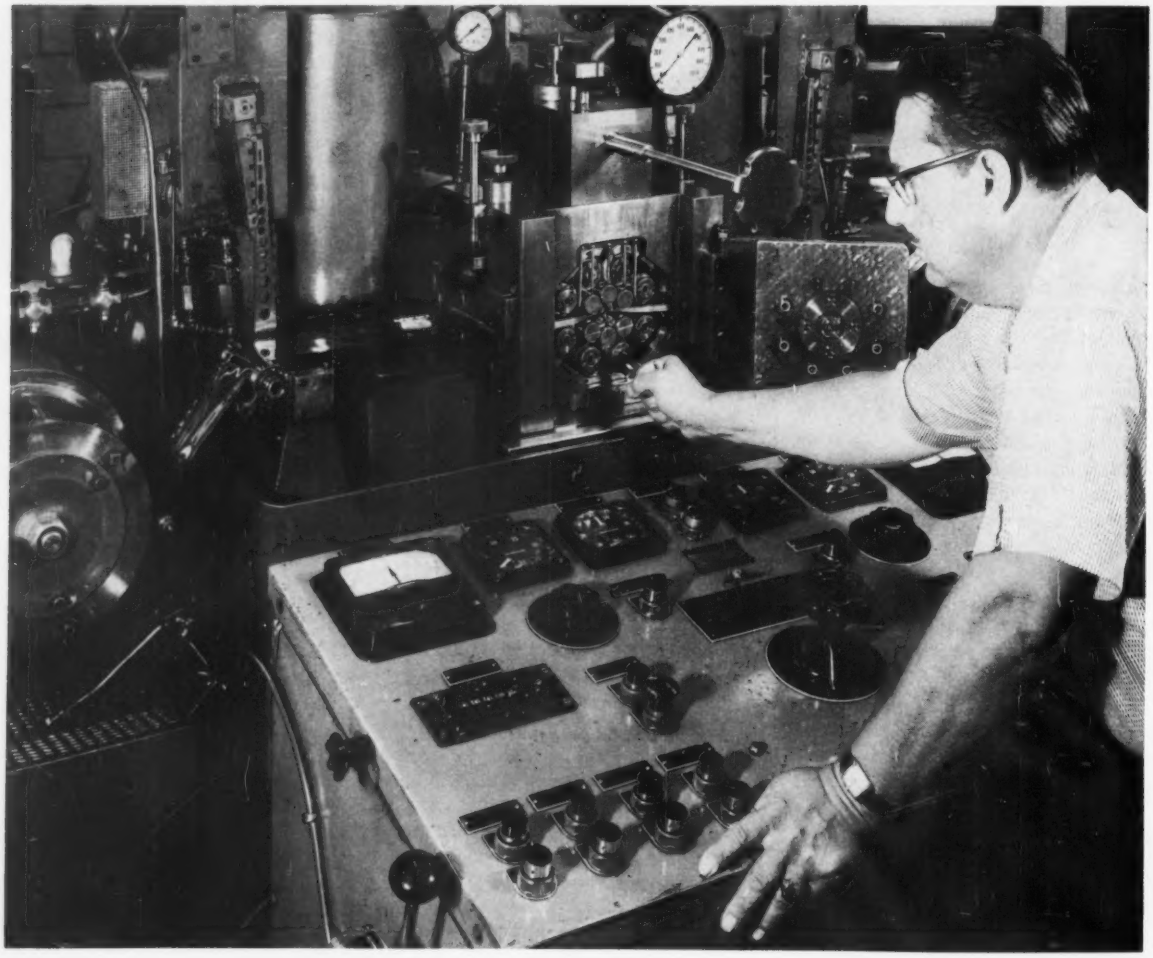
The early years of any new product usually bring out the bugs. U. S. Steel officials feel they have them all eliminated now. Once the operator on the job is thoroughly familiar with the rules, there ought to be no problems which can't be ironed out on the spot.

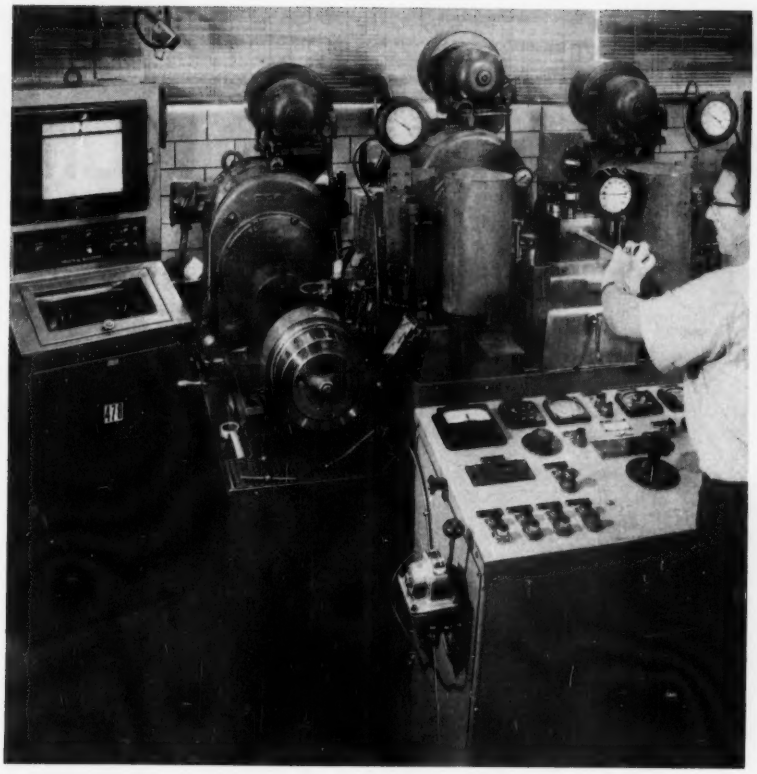
• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

This Man Rolls Metals Ghost Thin

Some of his products are only 1/35th as thick as a human hair. To make that kind of stock, he can keep a week's run within plus or minus 17 millionths of an inch. Here's an example of how an unusual metalworking skill in one field can aid progress in other fields

George Schmitt, roller, adjusts tension (above) and roll pressure (below) on Arnold Engineering's 20 high Sendzimir mill. Some of the ultrathin products it makes cost $3.6 million a ton—it's sold a few pounds at a time





Beta ray and x-ray gages provide a continuous check of foil thickness, but the real control of quality is visual, says Mr. Schmitt. Even a piece of dust can punch a hole and cause a tear

THE ROLLING of metals to a shadow - thin 85 millionths (0.000085 in.) is helping designers explore new fields of technology.

Computers are one example. Smaller, faster, and more efficient types with a bigger capacity for data can be designed around tinier transformers which depend on cores wound with ultrafine strip. (Performance and efficiency of such transformers depend on the quality of the strip.)

More accurate strain gages are also being made from tiny pieces of foil because their sensitivity is partly a function of thinness.

Other uses for thin metals include air gage diaphragms, tapes, shims, laminations for recording heads, and lighting contacts.

• Success in cold rolling to thinnesses under 0.0002 in. depends almost entirely on the skill of the roller, states Benjamin Falk, vice president, Arnold Engineering Co., Marengo, Ill.

Rolling has been the life work of one man at Arnold Engineering: George Schmitt, who is in charge of its Sendzimir mill. (The firm is a wholly owned subsidiary of Allegheny Ludlum Steel Corp., Pittsburgh.)

Mr. Schmitt has rolled most magnetic metals, including Mumetal, Deltamax, Mo-Permalloy, and Silectron. By the time he's through with the metals, they are more than 99 per cent work hardened regardless of the original material. Each pass, for example, reduces the strip 40 to 45 per cent. More than 40 metals have been rolled without annealing. High temperature S-590, for example, has a hardness of Rockwell 50 and a tensile strength of 128,000 psi.

"To roll metals this thin," says Mr. Schmitt, "you have to be 'shape crazy' and a little fanatic about tension." The quality of rolling is controlled by a sense of feel and the appearance of the foil as it emerges. There must be a slight curl on the edges to show that tension isn't too tight. You can also judge the condition of the strip by the reflection of light on the foil surface—slight waves, repetitive depressions, and frost are measures of quality. The tolerances of most products in this area are only a few light waves either way from a standard, and reflections of light are a sensitive indicator. A week's run on standard shim stock seldom varies more than plus or minus 17 millionths (0.000017 in.). Some runs are under 10 millionths.

Carbide work rolls for the little mill are about 1/4 in. in diameter and some 6 in. long. Due to voids and pinholes, Mr. Schmitt finds he is able to use only 20 per cent of the carbide blanks he buys. When finished, the rolls measure Rockwell C 80 in hardness.

They measure such stock by weighing. A standard circle is cut from the foil and carefully weighed on a laboratory balance. A calibration curve is plotted and the thickness read directly from beta and x-ray gages.

• Preliminary rolling is needed to prepare raw stock for the Sendzimir mill.

Standard mill tolerances run more than 10 per cent so coils as received are first run through a Stanat, four high, roughing mill which reduces the metal and brings thickness tolerances down to within plus or minus 3 per cent.

The Stanat is equipped with nozzles which can play hot oil on selected portions of the roll to compensate for slight differences in cross section.

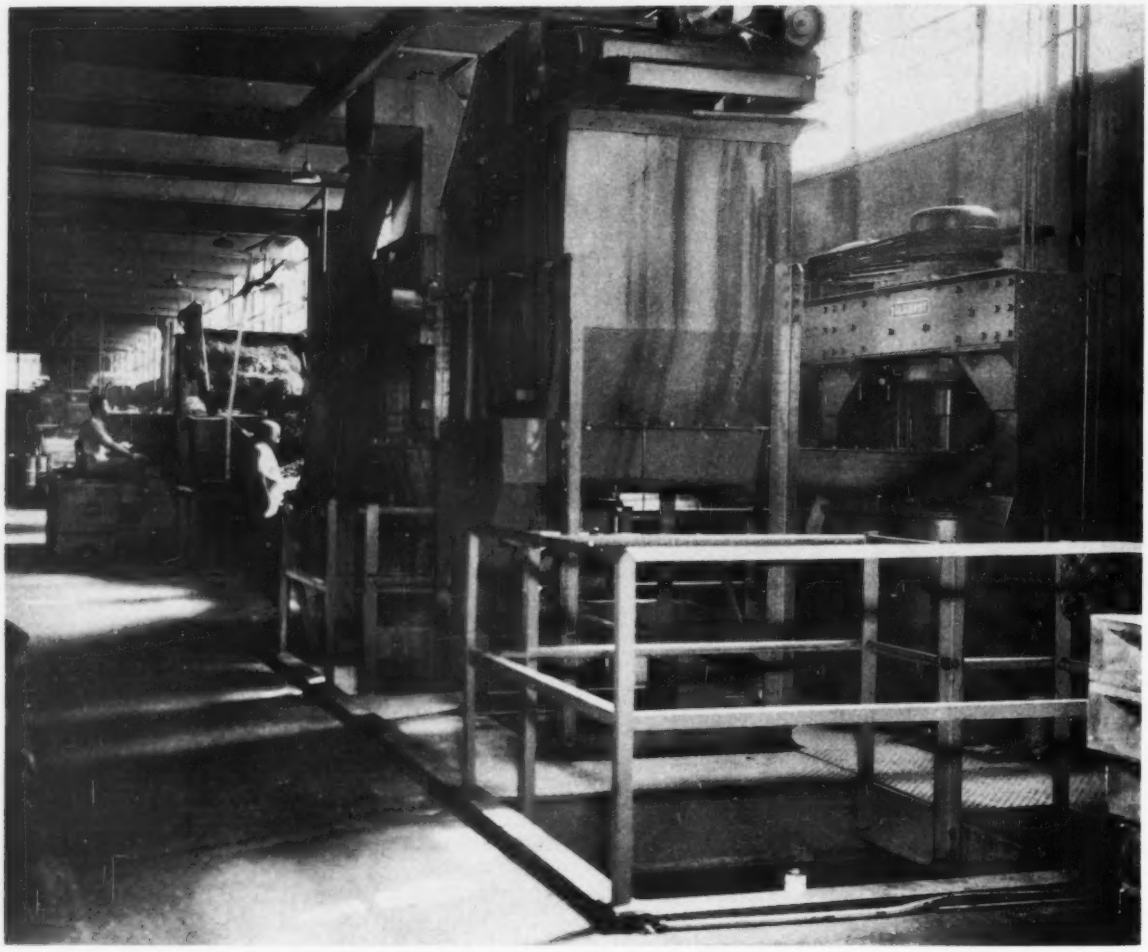
The company claims a unique position which it says has helped sales: It rolls the metals thin and also winds the little cores.

It puts great store in rerolling exceptionally small quantities of metals, not only thin gages. Orders are for as little as 2 lb.

Customers working with the Atomic Energy Commission often send tiny amounts (for a roller, that is) of strange metals never before produced in quantity. A "billet" of gadolinium, for example, was 1 1/2 in. in diameter by 1 1/4 in. long. The first four or five passes were done blind—an unusually tough assignment. Mr. Schmitt says that he has never lost such a billet.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Oil Reclaimed in First Year Pays for Chip Handling Line



Oily chips are trucked to a collection area, passed through a crusher and continuous chipwringer, then taken to a storage bin by a pneumatic system

Company reduced expenditures for cutting oil 83 per cent; scrap loads are no longer downgraded because they contain oil or tramp metal; system saves floor space for storage

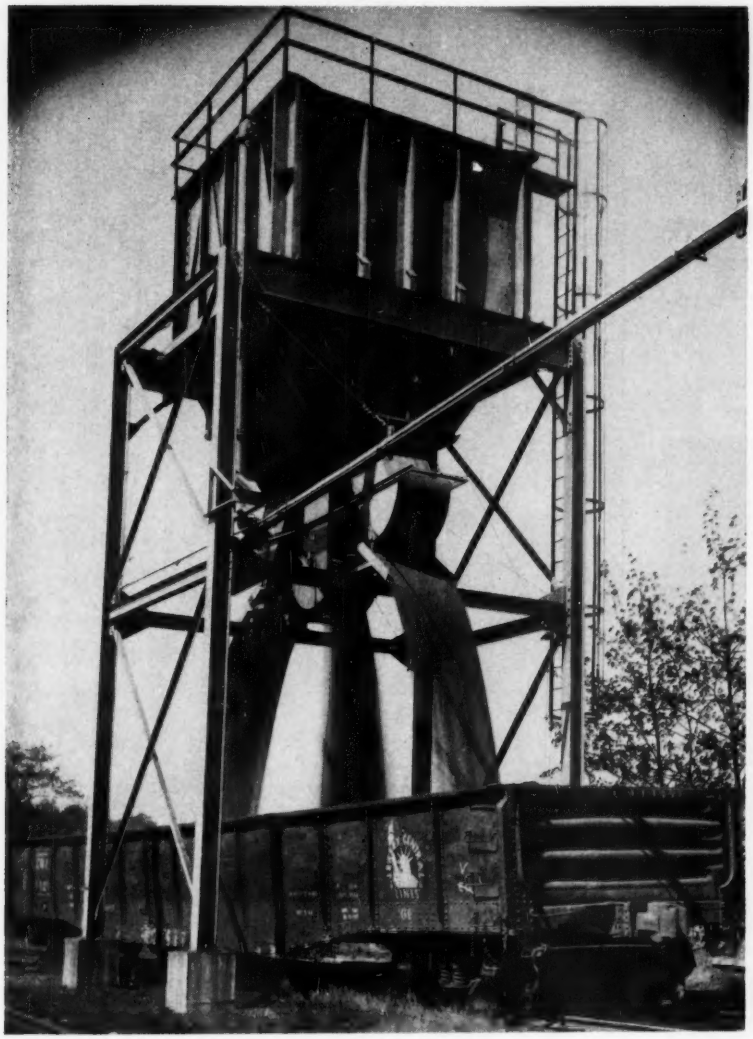
MACHINE SHOPS are reducing costs by using more efficient methods to extract cutting lubricants from chips and turnings.

A chip processing system that cost $60,000 reclaims enough cutting oil to pay for itself every year it's operated at Elastic Stop Nut Corp. of America, Union, N. J. Engineering knowhow and equipment were supplied by National Conveyors Co. Inc., Fairview, N. J.

• **The company had its choice: Install a new chip handling system, or buy new machines for the old setup.**

The old chip handling equipment was obsolete, and most of the machines were worn out. It would have cost about $18,000 to replace worn-out components.

But the system wasn't designed for the high volume of chips produced by the company's machine tools. Sometimes, oily chips were dumped in railroad cars because the



Dry, crushed chips are dumped into a railroad car from the overhead storage bin. Freight car takes on a load in 5 minutes

batch type manually operated oil extractor couldn't handle them fast enough. Result: Usable cutting oil was wasted. The oil was dripping from cars in the loading area, and scrap loads were often downgraded because they weren't clean.

Because small batches of chips were processed and dumped directly into railroad cars, the company was constantly paying demurrage.

• The new system processes machinings automatically. Chips are crushed, and oil is extracted; dry material is blown through a pipe to an overhead storage bin.

Turnings are fed from the chip deck (where oily chips are collected from the machines) to an apron conveyor that feeds a crusher. The conveyor starts and stops in alternate cycles, so the crusher won't be overloaded. Large pieces of scrap are rejected by a tramp metal trap in the crusher inlet hopper.

Crushed chips are moved into the oil extractor by twin screw conveyors. While chips are entering the centrifuge, the bottomless basket spins at 300 rpm—fast enough to hold material against the walls. At the end of the feeding cycle, the centrifuge is accelerated to 600 rpm. Oil is separated from the chips and collected for reconditioning. When the basket stops, dry chips fall out. Then they're blown through a 5 in. pipe to an overhead storage hopper, 265 ft away, for loading in railroad cars.

• Output of dry chips is impressive; cutting oil expenditures are reduced. Other benefits are claimed.

Operating costs are less for the new system than for the old. But the new setup handles almost 35,000 lb of chips (produced in three shifts) in 8 hours, or two freight carloads a week. A 50 ton car is loaded in 5 minutes. The old system had to be operated all three shifts to keep up with chip output.

Before the new system was put into operation, the company was using 5000 gallons of cutting oil a week. Now the same amount lasts six weeks.

All oil containing metal (sludge included) goes through the system; material cannot bypass any part of the line.

About 800 sq ft of floor space is released for storage because railroad cars don't have to be brought into the building for loading.

Maintenance costs are negligible, says John H. Baudoux, the company's material handling supervisor. All routine cleaning and servicing are handled by operating personnel. The Chipwringer barrel is desludged once a day. The oil collector ring is cleaned and the system is inspected once a week.

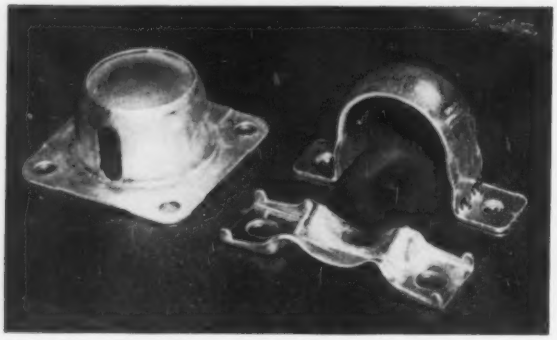
• The company also streamlined its chip collection system, from machine tools to the chip deck.

Chip boxes are equipped with casters, so they can be rolled under the chip discharge conveyors on automatic screw machines or other tools. Fork lift adapters on the boxes permit them to be lifted, taken to the chip deck, and dumped by rotary unloading lift trucks.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, *Penton Bldg., Cleveland 13, Ohio.*

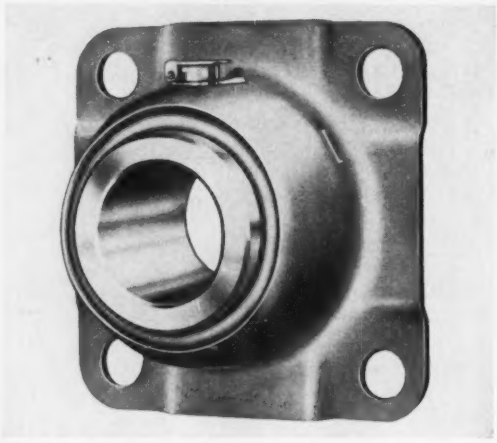
COST CRISIS . . . How to Beat It

Cost saving program to eliminate zinc plating led to the adoption of galvanized sheets for blanking stock. Today's tighter coatings permit deep draws without affecting corrosion resistance



Housings stamped from galvanized sheets

Two-part Bronzoil bearing assembly



Single cup-type bearing assembly

Galvanizing Replaces Plating, Saves Firm $5100 a Year

A SWITCH from ordinary hot rolled to galvanized steel will save $5100 for Dodge Mfg. Corp., Mishawaka, Ind., this year.

The product: Stamped housings for Bronzoil pillow blocks and flange bearings.

• **The change was started by the purchasing department which questioned the cost of zinc plating.**

The accounting department reported that the profit margin on Bronzoil bearings had nearly evaporated. As part of a program to prune costs, purchasing asked production to try making the blocks and housings from galvanized metal. The practice was to stamp the parts from hot rolled and pickled stock and tote them several miles to another company for zinc plating. Handling cost alone came to around 4 cents a pound.

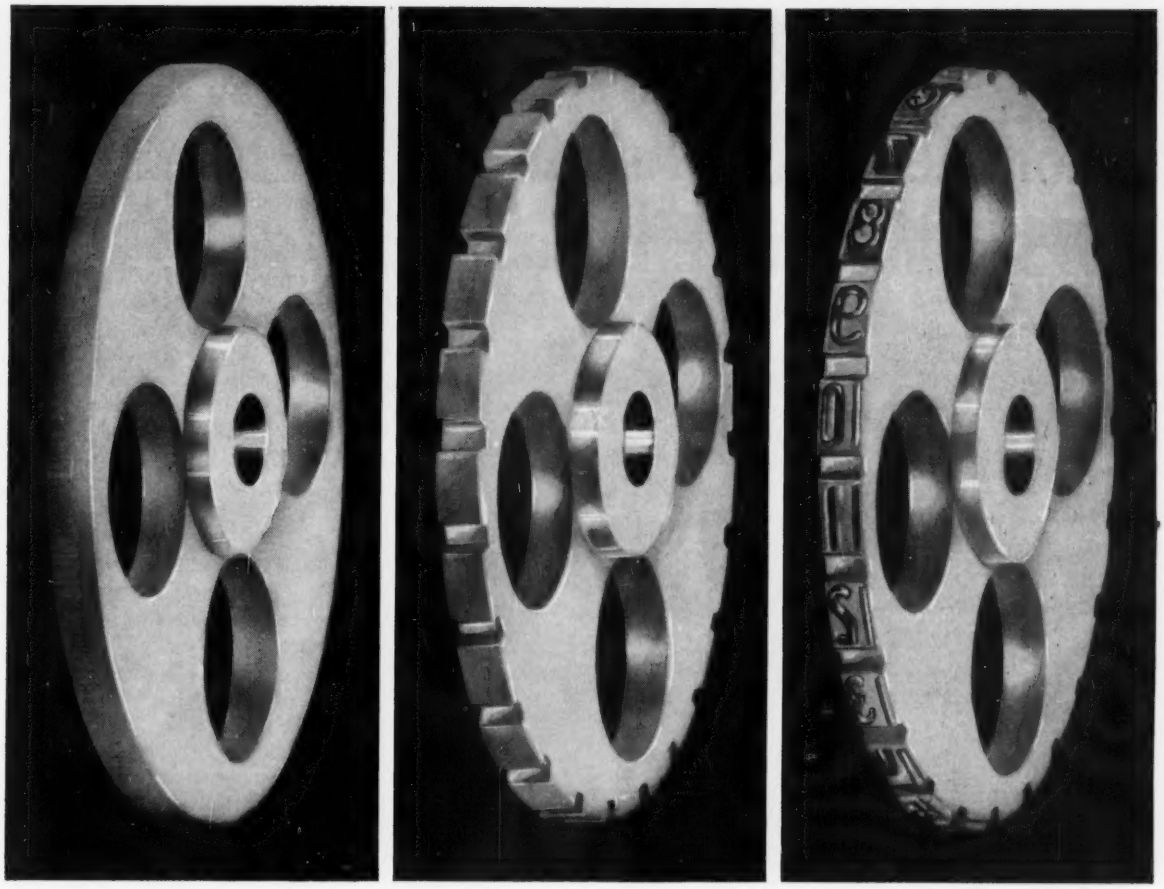
One question asked about galvanized metal was drawing quality. Two steel companies furnished samples for test runs. Both had the necessary drawability.

Another problem was weathering. A careful examination showed that the galvanized coating tended to bleed into the raw edges of the parts with a good rust inhibiting effect. Both engineering and sales approved the changeover.

• **Although galvanized sheets cost $1.25 per 100 lb more than bare stock, savings are realized in transportation and the elimination of plating.**

An intangible benefit, say Dodge engineers, is that manufacturing is completely under company control. The time lag for transportation and processing by subcontractors is eliminated.

Dodge expects to produce 170,000 lb of finished Bronzoil bearings from 14 gage galvanized steel this year at a saving of $3 per hundredweight. The estimate does not include savings from other bearing housings made from 12 gage stock or planned changes of similar parts which still require plating.



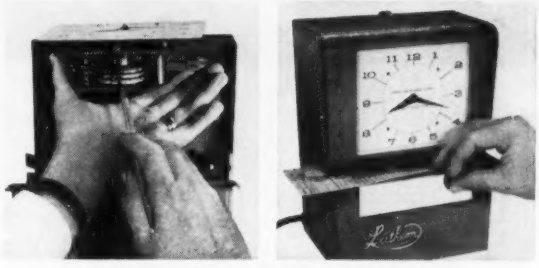
CHASE® BRASS MAKES THE WHEELS GO 'ROUND... FOR 20 YEARS!

Lathem Time Recorder Company guarantees the printing wheels in its time recorders for 20 years—unconditionally. And they guarantee themselves easier production and freedom from trouble by specifying Chase Brass strip.

According to Harrison G. Hooper, Vice President, plastics and practically every metal possible have been tried for type wheels. But they've now standardized on a Chase Brass strip alloy for these all-important wheels...call it the finest material they've ever used!

Other Chase metals are used, too. Hubs of the wheels are made using Chase 3-Mark Free-Cutting Brass Rod, which is turned, staked in a punched hole, straddle-milled, drilled and faced along with the wheel assembly. Posts and dividers in the clock are Chase Brass tube.

For all parts of the time recorder, brass and other copper alloys are used wherever possible...traditional sign of quality workmanship in clock making. *Your* product, too, can be made better, to higher quality standards, and to deliver better longer performance. First step is to talk over your metal needs with your nearest Chase representative, or write Chase at Waterbury 20, Connecticut.



LATHEM TIME RECORDER uses Chase® Brass for all critical parts. Top illustrations show index wheel in three stages of production from Chase Brass strip.

Chase

BRASS & COPPER CO. WATERBURY 20, CONN.

Subsidiary of ***Kennecott Copper Corporation***

THE NATION'S HEADQUARTERS FOR ALUMINUM • BRASS • BRONZE • COPPER • STAINLESS STEEL AND FORGINGS

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Automated Ladle Additions Up Steelmaking Efficiency

Feeder for alloying elements in use at United States Steel's Homestead Works

AUTOMATIC FEEDING of ladle additions can cut steelmaking costs and improve ingot quality.

If you're adding ferromanganese, ferrosilicon, or other alloys directly to your furnace or to a ladle by manually releasing the gate on a chute, it may pay you to investigate the ladle additions feeder. It weighs the alloying elements electronically and adds them to the ladle at controlled rates.

• Users claim that feeders save labor and manganese, eliminate freezing and separation, and reduce the spread in manganese content from first to last ingots.

The machine, made by Blaw-Knox Co., Pittsburgh, consists of one or more storage hoppers, an electronic weighing system based on load cells, and an electrical vibrating feeder. Blaw-Knox engineers say the unit brings automation of open hearth practice one step closer.

The machine operates on electricity and delivers manganese (2 in. size) at an average rate of 3000 lb a minute and a maximum rate of 4500 lb. Twelve rates of feed make it possible to adjust additions to meet various tapping conditions. Additions are normally started when the ladle is 20 per cent full and completed by the time it's 80 per cent full. If the power fails, a built-in emergency dump system functions, feeding by gravity. By this arrangement, the addition can also be controlled and weighed.

Although steelmakers have known for several years that less manganese is lost through oxidation when additions are made to the ladle instead of to the furnace, they discovered only recently that quality losses could be minimized by controlled feeding. Case in point: Using conventional furnace blocking principally and ladle equipment (hopper, chute, and manually operated gate), one company added 10,000 lb of manganese to its heats but recovered only 7000 (as shown by analysis of ingots, butts, and skulls). After installing a ladle additions feeder, the firm had an average recovery of 8300 lb. By upping its manganese efficiency from 70 to 83 per cent, it saved 1300 lb or $159.25 a heat (74 to 76 per cent manganese costs about $245 a ton, or 12¼ cents a pound.)

• Use of the feeder prevents metallurgical problems that result when manganese falls into the ladle at an uncontrolled rate.

If you add too much manganese at the end, you get a floating island and a chilling effect in the ingot. If you add too little, the slag carries it off. You get a fadeout, and you have to divert or scrap the ingot.

Since the introduction of automatic feeding, steelmakers have abandoned the notions they once held about "excessive" ladle additions. In the early forties, it was thought that not more than 1700 lb of manganese could be added to a 120 ton heat (14.1 lb per ton). Nonuniformity of ingots was feared. Open hearth shops equipped with feeders are now adding 28 to 30 lb per ton.

• In addition to saving money and improving ingot quality, feeders eliminate a lot of hard work. They're gaining popularity with steelmakers.

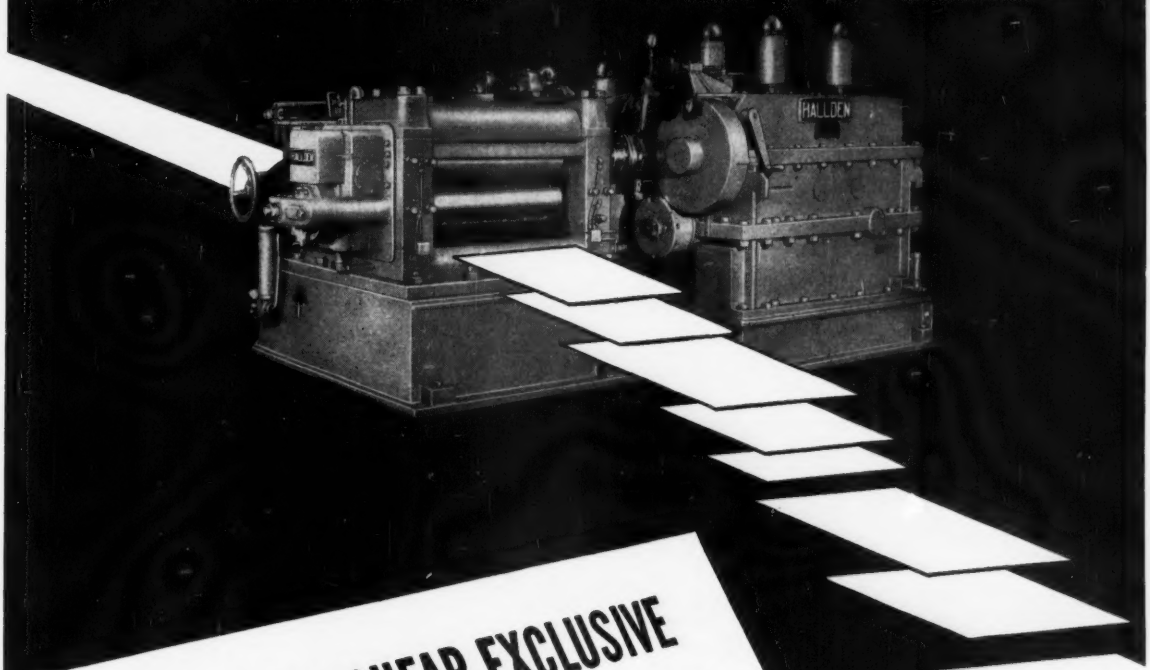
First helpers can devote more time to tending their furnaces. They don't have to run around and pick up thousands of pounds of manganese several times a day because the hoppers hold enough material for at least three heats.

About 50 machines have been sold to American steel plants. (Lone Star Steel Co. had the first one.) Many more are being ordered. Other firms which are using or have ordered them include Youngstown Sheet & Tube Co., Re

(*Please turn to Page* 176)

NOW - A NEW "*Push Button*" FLYING SHEAR

NO DOWN TIME to change cut length or synchronization



A HALLDEN SHEAR EXCLUSIVE

A major improvement in high production continuous strip process in-line shearing.

Revolutionary new designs now permit synchronization adjustment AND gear changes to be made without stopping production. Changes in cut lengths are made in just seconds.

Hallden Shears can be furnished in processing lines built by leading machinery manufacturers the world around.

DESIGNED AND BUILT BY

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THE SHEARING SPECIALISTS

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Behind every EC&M controlled installation...

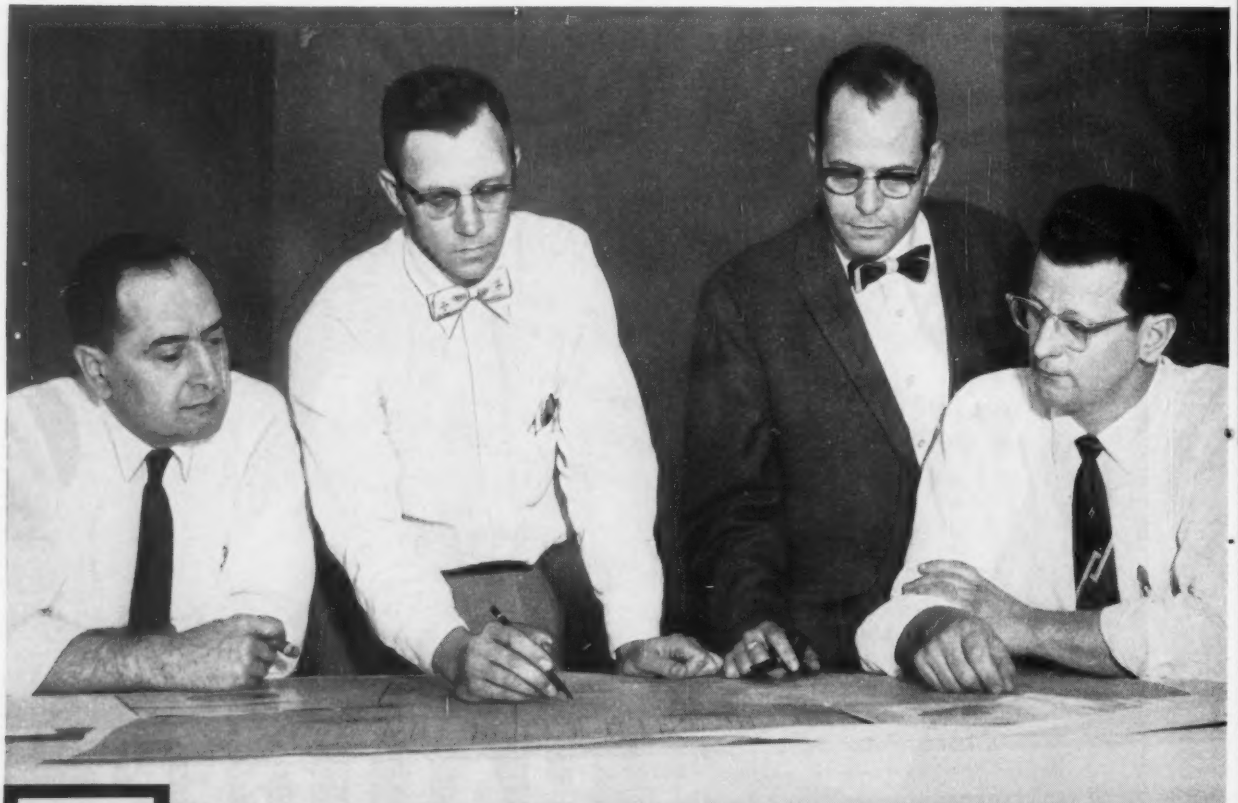
...an EC&M engineering team coordinated their knowledge and experience to design the control system best suited for that particular installation.

EC&M's engineering team studies every facet of an installation...nothing is taken for granted. Then, and only then, is a control system designed.

Advance planning of this type has two important advantages. First, the "tune-up" time of the installation is practically eliminated. Secondly, future maintenance is substantially reduced.

No matter what your requirements may be ...adjustable voltage or constant potential, an ore bridge or an automatic rolling mill control system...EC&M engineering counsel is available to you without obligation.

It will pay you to call EC&M into consultation early, when planning your next installation.



THE ELECTRIC CONTROLLER & MFG. CO.

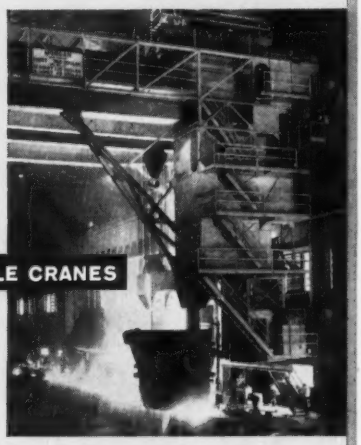
A DIVISION OF THE SQUARE D COMPANY

CLEVELAND 28 • OHIO

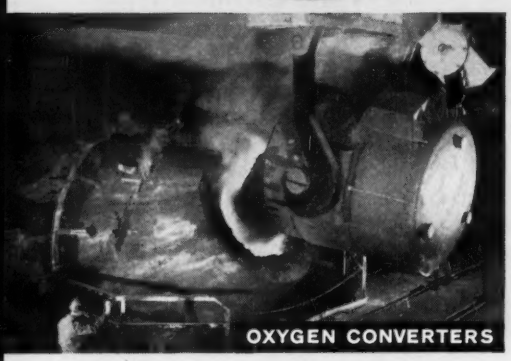
Installations Equipped with an EC&M Control System

OVERHEAD CRANES

ROLLING MILLS

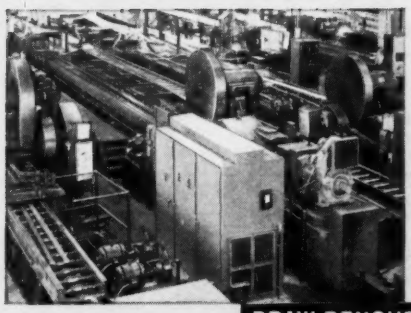


LADLE CRANES



OXYGEN CONVERTERS

ORE UNLOADERS



DRAW BENCHES

There's an EC&M Control System to fit every application or installation

Material Handling

- Cranes
- Ore Bridges
- Unloaders
- Conveyors
- Car Dumpers
- Aerial Tramways
- Hoists:
  - Skip
  - Mine
  - Slope

Rolling Mills

- Blooming
- Slabbing
- Plate
- Rail
- Beam
- Billet
- Bar
- Rod Merchant

Steel Mill Machinery

- Ingot Buggies
- Screwdowns
- Edgers
- Feed Rolls
- Sideguards
- Manipulators
- Table Rolls
- Transfers
- Coilers
- Oxygen Vessels

Steel Mill Accessories

- Planers
- Lathes
- Boring
- Milling Machines
- Presses
- Scalpers

Processing Lines

- Slitting
- Leveling
- Welding
- Shearing
- Cleaning
- Scrubbing
- Temper Pass
- Reducing Mills
- Wire Drawing
- Draw Benches
- Tube Mills

LADLE ADDITIONS . . .

public Steel Corp., Armco Steel Corp., and U. S. Steel Corp. Most open hearths and a majority of the electric furnaces can use the feeder. Designed to order, they cost $10,000 to $40,000 each.

• Electronic control equipment is available. Eventually, additions may be controlled completely by a tape or punched card system.

The control system includes a digital printer, which transcribes accurate measurements on tape or punched cards.

The system presents subtotals and totals of measurement data, indicates time and date of additions, and permits identification of heats. It provides for remote or unattended operation, with accessible or locked records.

Vacuum Mechanism Helps Stack Stampings

An overhead vacuum mechanism solved a stacking problem for a stamping operation where a 7 mil thickness of aluminum is being ejected.

The stampings are fins for heat exchangers made by Westinghouse Electric Corp.'s air conditioning plant at Staunton, Va. Previously, the fins were made from 13 mil material which was run through a punch press die in single strips, cut off, and gravity fed down a chute into a stacker where they were loosely aligned.

The problem: The 7 mil fin is made by stamping and shearing strips to desired length from coiled stock. The old method of stacking didn't work because the thinner material is less rigid and lighter.

The problem was solved when Westinghouse discovered that the thinner strips will drop and stack if there is no lateral motion at the drop point.

An overhead vacuum mechanism now catches the strips after they're ejected from the press. They're held while the press feeds the desired length of fin; then they are sheared and dropped vertically as the vacuum is momentarily broken. The fins drop onto guide rods until the correct number is obtained. A new set of guide rods is then indexed and the cycle repeats.

Paint Parts Inside, Dry Them Outside

Placing part of automatic dip painting line on building roof also eliminates fumes, lowers heat input to air conditioning equipment at Cutler-Hammer Inc.

IF you don't need all your manufacturing steps inside the plant, why not put some outside?

Cutler-Hammer Inc., Lincoln, Ill., did just that in setting up a new factory for the manufacture of low voltage distribution equipment; part of the dip painting line is on the roof. The arrangement saved 4000 sq ft in costly floor area, eased the air conditioning requirements, and avoided paint fumes in the building. The system also provides for easy expansion and reduces rejects due to dirt.

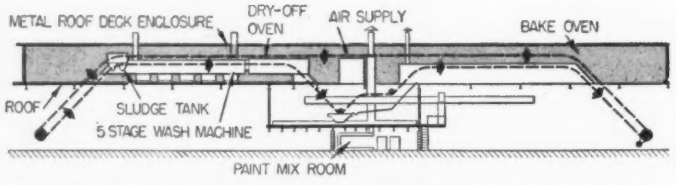
• On the Roof—Loading, unloading, and the actual dipping operation are done inside the plant. A conveyor system carries enclosures for the electrical components up to the roof top, where they pass through a five stage washer and a dry-off oven. The work returns to the inside of the building to be dipped in a synthetic enamel, then again ascends to the roof where it is baked at 350°F for 30 minutes. Oven heat cannot escape into the building, so less load is placed on the air conditioning system.

Painted parts are brought back into the building to the unloading station, and the conveyor returns the fixtures overhead to the starting point.

• Flexibility Built In—Speed of the conveyor is adjustable (1½ to 4½ ft per minute). The crossbars, 8 ft long on 16 in. centers, will take loads up to 250 lb. The Industrial Equipment Div. of R. C. Mahon Co., Detroit, designed the installation with dip tanks which can be switched quickly when a change is made in material on the line. A separate batch painting room for special colors or oversize parts has its own oven for drying.

Rejects due to dirt are held down because of a filtered air supply and because the area is away from plant traffic.

Since designing was done when the plant was being planned, provision was made to expand the operation by taking out a building wall.



Drawing shows conveyor arrangement in relation to floor and roof; paint mixing area is below dip tanks

Improved cutting performance . . . plus rancidity control

From Esso Research after two years of field testing comes a new heavy-duty emulsifiable cutting oil that combines all these outstanding advantages:

Deeper cuts, faster speeds, longer tool life. Kutwell EP 66 contains extreme pressure agents that enable it to handle the toughest cutting, grinding, sawing and drilling jobs. Milling a high-alloy steel, for instance, a jet engine component manufacturer reports output jumped from 35 to 117 pieces per tool grind after Kutwell EP 66 replaced a high-cost specialty oil.

Machine lubrication—Kutwell EP 66 leaves an easy-to-see film of oil on the ways, cams and working parts of the machine tool for highly efficient lubrication.

Rancidity control – Kutwell EP 66 contains an effective bactericide selected by Esso Research to keep emulsions sweet smelling and serviceable for longer periods of time.

For special alloys and other tough machining jobs, Kutwell EP 66 will outperform conventional soluble cutting oils and many high-cost compounded mineral oils. An Esso representative will be glad to show where Kutwell EP 66 can do a better job in your operation.

Call the Esso office nearest you, or write: Industrial Lubricants Division, Esso Standard Oil Company, 15 West 51st Street, N. Y. 19, N. Y.

Esso

In industry after industry..."ESSO RESEARCH works wonders with oil"

ACHESON

dispersions digest

Reporting uses for

dag® BRAND DISPERSIONS

COLLOIDAL DISPERSIONS OF GRAPHITE, MOLYBDENUM DISULFIDE, AND OTHER SOLIDS

'dag' and 'Prodag' are trademarks registered in the U. S. Patent Office by Acheson Industries, Inc.

MUELLER BRASS SAVES $15,000 A YEAR ON FORGING LUBRICATION

Efficiencies realized by just one company — with the help of Acheson Dispersions — have already added up to this substantial savings. Uniform coverage, easy sprayability, and lasting lubrication effectiveness are providing this leading forgings producer: longer die life, increased production, fewer rejects, and improved forgings. This lubricating success story is being repeated throughout the metal working industry. Possibly *you* could profit from the use of an Acheson Dispersion.

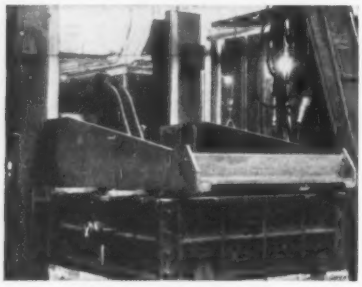
'Prodag' application on forging presses at Mueller Brass Company has saved between $15,000 and $17,000 annually for the past fifteen years. These impressive savings earned by this Port Huron, Michigan company — the world's largest producer of brass and bronze forgings — have been realized in many areas.

Previously, crank forging pressmen at Mueller swabbed the dies between each press stroke. Mueller designed their own spray apparatus, both manual and automatic, to lubricate lower and upper dies simultaneously. Time studies have shown that spraying has effected a five percent-per-pound economy over the swab method.

Spray application of 'Prodag' at Mueller Brass Company has resulted in impressive production savings.

Even more importantly, by using Acheson's 'Prodag' — a dispersion of graphite and water — diluted 1:35, Mueller has gained longer die life, reduced the percentage of scrap loss, and has obtained a better finish on their forgings. According to Mr. O. M. Hanton, Chief Forging Engineer for Mueller, "with 'Prodag' we get the right amount of lubricant on the die. Swabbing resulted in too much lubrication at one place or another in the die cavity, resulting in either a ruptured die or a defective part. Previously, every forging produced had to go to the grinding department. And grinding is one of the most expensive operations in a forge shop."

In producing deep-cavity forgings, or products which demand much smaller tolerances, Mueller uses 'dag' No. 3 — another of Acheson's graphite-water base dispersions. If you have a forging lubrication problem it will pay you to call in your Acheson Service Engineer or write for Bulletin No. 426.



'dag' 35, brush-applied to the slides of this rollover machine, increases machine life for this midwest foundry.

An expensive foundry problem was solved for the D. J. Murray Manufacturing Company, Wausau, Wisconsin, with the use of Acheson's 'dag' 35 — colloidal graphite in an alkyd resin solution. Slides on the huge rollover machine installed in their foundry division, previously lubricated by first a dry graphite and then rosin, were becoming deeply scored as a result of its 90-cycle-a-day operation in the handling of bench and floor molds.

The scoring and machine vibration was so severe that according to Maintenance Foreman, Ben Sayles, "we could see that the life of the machine was going to be very short if we continued this method of lubrication." Coating the slides daily with 'dag' 35, improved machine operation immediately. The scoring all but disappeared. After two years of application with this Acheson dispersion, no repairs have been necessary and none are foreseen. Since the entire production of their grey iron sand slinger line — some 60 tons of material in 8 hours — goes through this machine, the downtime avoided represents an important savings to the company.

For additional information, write for Acheson Bulletin No. 425. Address Dept. S-99.

ACHESON *Colloids Company*

PORT HURON, MICHIGAN

A division of Acheson Industries, Inc.

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Offices in: Boston • Chicago • Cleveland • Dayton • Detroit • Los Angeles • Milwaukee New York • Philadelphia • Pittsburgh • Rochester • St. Louis

Bearing Material Lasts For Life of Car

A bearing material made of plastic impregnated fabric is eliminating the need for lubrication in applications ranging from miniature instruments to hydroelectric stations. In some cases, bearing life has been increased as much as eight times.

The material is inert to acids and alkalies and is not subject to electrolysis or salt water corrosion. In addition, it's light, resists high temperatures, is dimensionally stable under most atmospheric conditions, and has a low coefficient of friction.

• **Applications**—Major uses will be in the automotive field. The bearings are expected to function for the life of a car without lubrication or appreciable wear.

In a typical application, a bearing in a steering knuckle withstood a 200,000 mile simulated travel test with no signs of wear or oxidation.

The bearing material is also expected to be used in aircraft, material handling equipment, industrial machinery, hydroelectric equipment, marine apparatus, and in miniature instruments.

The bearings (made by Russell Mfg. Co., Middletown, Conn.) use both Teflon and cotton yarns woven into a fabric. After dipping in a phenolic resin, the bearing is formed. The resin is a high strength and heat resistant type called BLS-2680 by Union Carbide Plastics Co., a division of Union Carbide Corp., New York.

Offers New Bar Series

A wider choice of machinability to toughness ratios is claimed for a new series of cold finished bars produced by Republic Steel Corp., Cleveland.

The advantage: A buyer will be able to pick the least expensive grade of steel which meets his needs, the firms says. Five degrees of sulfur content (0.33 to 0.050 maximum) give several degrees of machinability—lower sulfur content means improved toughness and resistance to shock at some sacrifice in machinability.

Minimum yield strength of all grades is 100,000 psi.

Got High Heat Problems? Insulate with Silica Foam

It isn't as bulky as most other materials, so you don't need reinforcing. It's recommended for applications up to 2000° F. You can cut, saw, or drill it

A SILICA FOAM insulating material (called Foamsil) may help solve your high temperature insulation problems. It's already insulating such things as environmental chambers which simulate flight conditions for testing rocket, missile, and industrial components.

• **Characteristics** — It resists high temperatures (up to 2200° F); withstands thermal shock; and requires less bulk, says Pittsburgh Corning Corp., Pittsburgh. A 6 in. thickness is doing the job of 18 in. of conventional material in one application.

Insulating cost is about one-fifth of that required with other materials, says the company. Thicker, conventional walls would require reinforcement, probably with stainless steel. The reinforcement would also conduct heat and make the insulation less effective.

• **Rugged, Handles Easily**—Compressive strength is about 200 psi. It can be drilled, sawed, or cut, and it does not absorb moisture.

In the thermal shock test, the temperature was increased from 80 to 1000° F in 15 minutes and then dropped to −100° F. No breakdown occurred in the material.

• **Application** — An environmental chamber (made by Webber Engineering Corp., Indianapolis) was designed for the U. S. Navy's material testing program. Temperature in the cabinet reaches a maximum of 1000° F. A special bonding material holds Foamsil insulation blocks (22 x 17 x 2 in.) together and secures them to the wall. Internal volume is 27 cubic feet. Overall dimensions are 6½ x 5 x 4 ft. That includes heating, refrigeration, and control equipment.

An industrial model is available.

there are local stocks and

there are specialty steels and

there is technical assistance and

Carpenter local stocks

And the difference is . . . *Carpenter's* wide range of grades, shapes and sizes in Stainless Steels, Tool and Die Steels, and Special-Purpose Alloy Steels . . . ready for off-the-shelf delivery from 20 Mill-Branch Warehouses strategically located from coast to coast.

Carpenter specialty steels

And the difference is . . . *Carpenter's* exclusive MEL-TROL process which utilizes a *patented* mold to reduce segregation of harmful impurities during solidification of the ingot. Result: cleaner, tougher, more uniform specialty steel from surface to center . . . predictable performance in service.

Carpenter technical assistance

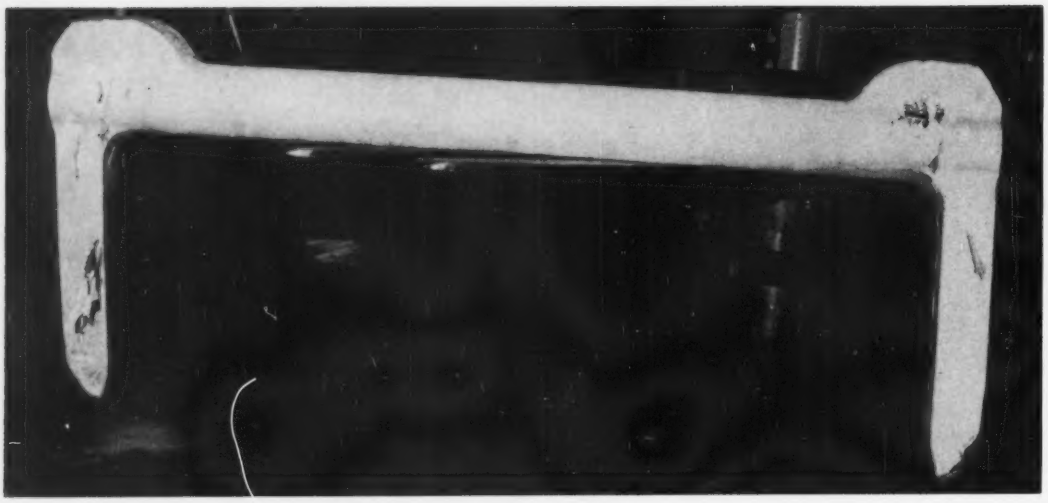
And the difference is . . . *Carpenter's* 70-year history of technical leadership, coupled with a reputation for *sharing knowledge.* Every day *Carpenter* representatives and metallurgists are helping someone like yourself solve a problem. And no matter how difficult your problem, there's an excellent chance that our continuing research and development program has already developed information to save you time and money.

Call your local *Carpenter* SERVICE-CENTER today . . . let us prove the difference.

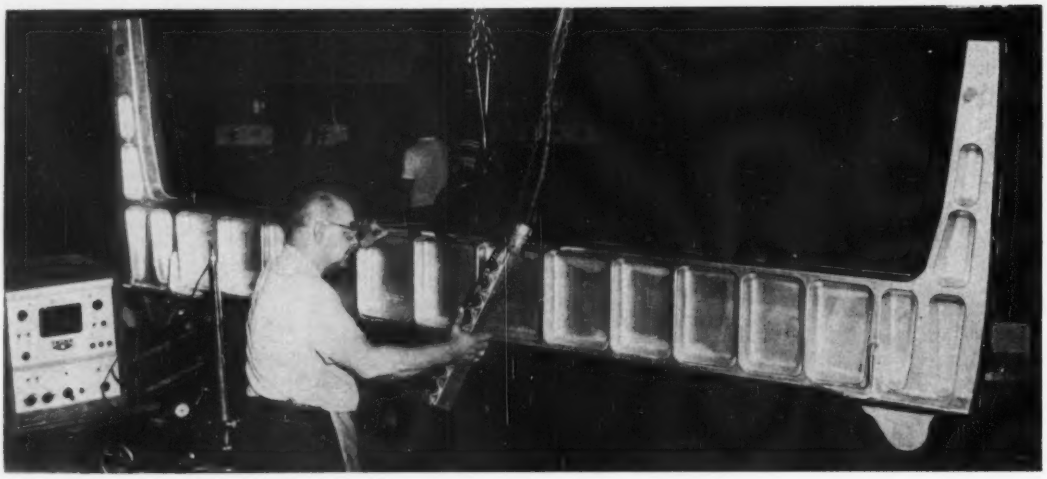
tool and die steels
stainless steels
high temperature alloys
electronic, magnetic and electrical alloys
special-purpose steels
tubing and pipe
fine wire specialties

Carpenter **steel**

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.



This extruded and preformed forging gets squeezed . . .



Becomes this one piece aluminum forging weighing about 800 lb

Commercial Jet Plane Takes Huge Forging

One piece of aluminum forms aircraft bulkhead, replacing several hundred parts. The closed die operations were done on a 50,000 ton press, once in Air Force program

A MULTISTORY, 50,000 ton closed die forging press, constructed as part of the Air Force's heavy press program, has turned out giant aluminum forgings for civilian aircraft.

The press is at Wyman-Gordon Co.'s plant at North Grafton, Mass. The parts are 12 ft long aluminum bulkheads for the 25 Convair 600 jet transports being built for American Airlines. Two forgings go into each plane.

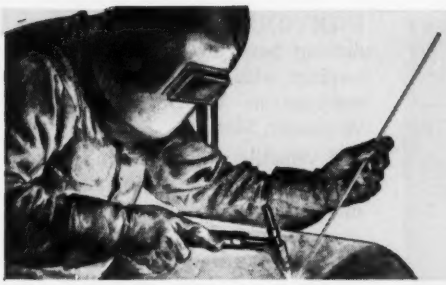
Wyman-Gordon says the parts are the largest closed die forgings it has ever made for commercial aircraft. They are the largest used by Convair in a commercial plane.

• **Process** — Each bulkhead was formed from a 19 in. diameter 70-79S aluminum billet. A wide range of equipment was needed to complete each part, including 1500 and 7700 ton side cylinder presses.

After extrusion, the parts were preformed by turning the ends so grain flow of the extrusion was preserved. Then the closed die operations were completed.

Close control had to be maintained over both die design and temperatures during forging and heat treating.

After final forging, solution and age heat treatments, the forgings were pickled, dimensionally checked and inspected by visual and ultrasonic methods.



WELDING CLINIC

J. Imperati and R. F. Pulver, Welding Engineers
The American Brass Company, Waterbury, Conn.

EVERDUR® ROD SPEEDS WELDING OF GALVANIZED STEEL

Arc welding is usually the most expedient means of reducing distortion, the major source of trouble in welding light-gage metal. However, metal-arc welding with covered electrodes adds more problems than it solves, due to difficult control and the need to remove slag and spatter from the product. Such difficulties are frequently encountered in steel sheet metal work.

In contrast, carbon-arc and inert-gas tungsten-arc welding offer easy control and eliminate slag and spatter. When these processes are used with a copper-alloy filler rod, such as Everdur-1010, control is greatly improved because Everdur's lower melting point produces bonding with only minimum melting of the steel. Increased welding speeds and the narrow heat-affected zones mean reduced distortion. Joint properties are adequate for all but the most exacting applications.

The narrow heat-affected zones make these processes attractive also for welding galvanized steel because they cause the least possible disruption of the protective zinc coating. With non-rusting copper-alloy welding rods they make the most dependable joints possible. So, Everdur-1010 has become a favorite filler metal for use with these processes in the fabrication of galvanized structural elements, ducts, and various types of container.

WELDING AIR-CONDITIONING DUCT SYSTEM FITTINGS at Carrier Corporation's plant in Philadelphia, using the carbon-arc process, with Everdur-1010 Welding Rod.

Carrier Corporation is one of the many concerns that utilize these advantages in their manufacturing operations. For many years, fittings and other components of their air-conditioning duct systems have been produced with ease and economy by welding with the carbon arc and Everdur-1010 Welding Rod.

Best results in welding either plain or galvanized steel require that only the least possible amount of steel be melted. To insure this it is necessary to avoid weaving so as to keep the arc always on the bronze weld metal. Arc lengths are kept as short as possible and current values set low enough to require welding speeds that can be handled with ease.

Joint types usually employed in sheet metal work—square butt, lapped, edge, and corner welds—are suitable for use with these processes.

Free Technical Service. If you have questions regarding the possible application of these processes to your job, Anaconda specialists will gladly help with suggestions. For such help or a copy of Publication B-13 write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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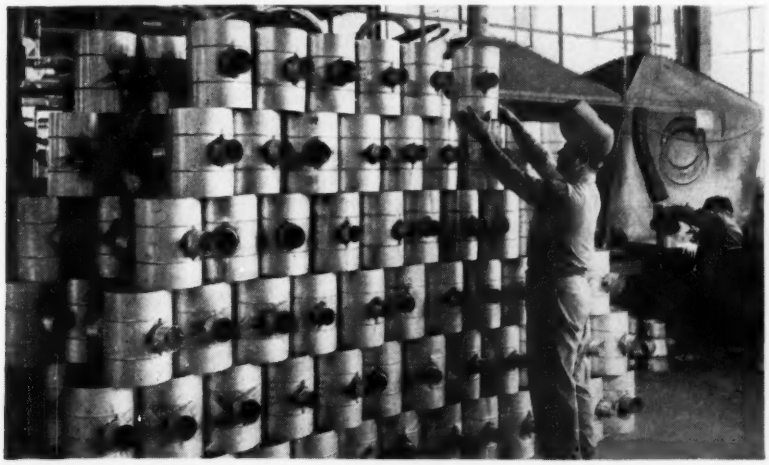
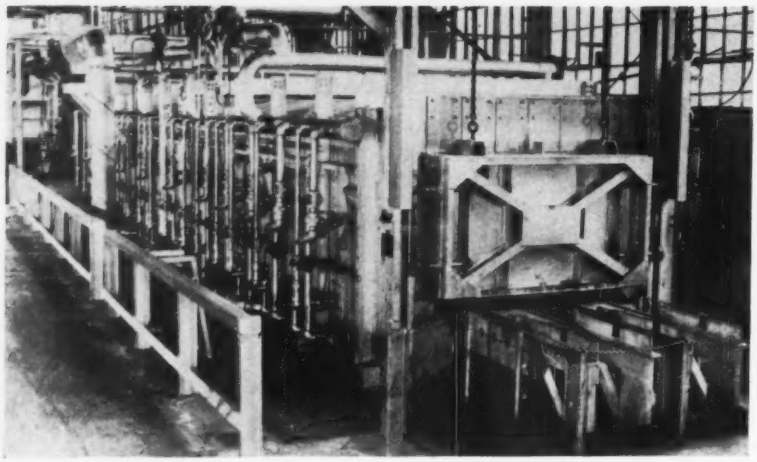


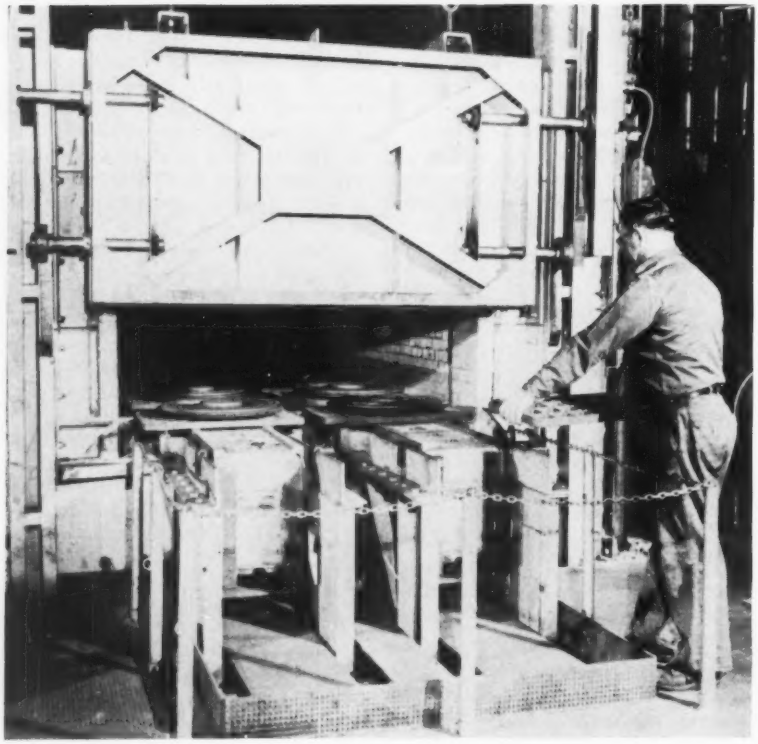
ANOTHER VIEW OF AREA devoted to welding Carrier duct system components.

ANACONDA®
WELDING RODS
made by
The American Brass Company



Long Production Furnace Babies Precision Forgings

Wyman-Gordon heat treating unit handles workpieces on an individual basis, reduces scale, furnace damage, improves surface. Easy maintenance is built in



INDIVIDUAL handling on a production basis produces heat treated forgings with good surface and low warpage at Wyman-Gordon Co., Worcester, Mass.

A versatile walking beam furnace, hydraulically actuated, handles commercial and aircraft steels, as well as special high temperature alloys, at temperatures up to 1900° F. Parts may weigh as much as 375 lb. The furnace will process up to 10,000 lb per hour.

John P. Molony, Wyman-Gordon's Eastern Div. instrument engineer, reports that individual handling couples with the gentle action of the walking beam mechanism to eliminate processing damage due to bumping or abrading, and provide uniformly heated work; rapid heating reduces the amount of scale formation. Continuous operation of the furnace, regardless of the size of the parts or changes in part size during operation, is another valuable feature.

• **Flexible Furnace**—The stroke of the two main beams may be varied in multiples of 10¾ in. up to 43 in., and the work is carried on trays which can be used singly or in groups. Use of multiple trays permits handling of larger forgings without special fixtures.

The manufacturer, Surface Combustion Corp., Toledo, Ohio, designed this direct fired gas unit for easy maintenance. Brick piers carry the work on the walking beams and stationary supports; capping of the piers with easily replaceable alloy face plates permits renewal of the wearing surface when necessary. The driving components below the furnace chamber are built of construction steels, made possible by the use of an enclosed chamber, air cooled by a 4000 cfm blower to keep temperatures close to ambient.

The walking beams are made to rise and fall by a wedge and roller arrangement supported on concrete bases and powered by hydraulic cylinders. Similar cylinders drive the beams forward and back. Action of the cylinders is consecutive to provide the required rectangular movement (down, back, up, forward) for the beam cycle.

Load and unload operations employ similar but separate drives. Interlocks and timing mechanisms pre-

vent incorrect operating sequences, although the discharge end provides manual control so that one or a combination of trays can be removed for quenching in oil or water. For normalizing, air cooling is used. Dogs on the unloading mechanism push against any trays which have become skewed at the furnace exit to realign them. The operator at the discharge end can control the cycle as required and can change the stroke length of the furnace.

• **Has 54 Burners** — Temperature uniformity, essential for the high quality, close tolerance forgings produced by Wyman-Gordon for aircraft and missiles, is obtained by the use of 54 proportioning, low pressure, gas burners. They fire directly into the furnace at the roof arch and below the stationary beams from both sides and are staggered for proper input distribution.

The burners are divided into four control zones, each with a Minneapolis-Honeywell pyrometer controller. A multipoint strip chart recorder provides a permanent record of all zones. Zone control is important because of furnace working dimensions: It's 48 ft long, 7 ft wide, and 4 ft 3 in. high at the arch.

Coolant Trims Costs, Lengthens Blade Life

A steel user who tried a specialized cutting coolant reported it increased saw blade life, improved edge finish, and reduced coolant requirements by 90 per cent.

The user tried the specialized coolant on several kinds of steel, including round, bar, angle, and flat stock in different sizes, thicknesses, and hardnesses.

The company investigated a number of coolants specially made for problem applications, choosing high detergency Keystone 106, made by Keystone Lubricating Co., Philadelphia. It costs less since it is applied in diluted form. The water to coolant ratio is 10 to 1. Savings amount to more than 90 per cent. (The coolant formerly used was applied full strength, did not give adequate blade life.)

Keystone 106 contains no oils and forms a true chemical solution, says Keystone. It inhibits rust and can be mixed with antifreeze.

Mill Burnished Tubing Cuts Costs Five Ways

1. Maker of relays eliminates an expensive broaching operation.

2. Prunes part cost 30 per cent.

3. Gains better inventory control.

4. Reduces handling.

5. Improves quality.

PRODUCTS such as relays can be made better at less cost with mill burnished tubing, says Adams & Westlake Co., Elkhart, Ind.

The company uses the material to house quick acting and time delay relays. The inside of the tubing (Type 304) is a guide for a plunger. Even small imperfections can interfere with operation. The unit (mercury displacement type) is expected to give troublefree operation for at least 30 million cycles.

• **Prior Problems**—The broaching operation which had been used to produce the desired internal dimensions and finish was costly and troublesome. Even the surface of superfinished tubing had tiny radial marks that had to be removed. The company had no broaching equipment and had to subcontract the job.

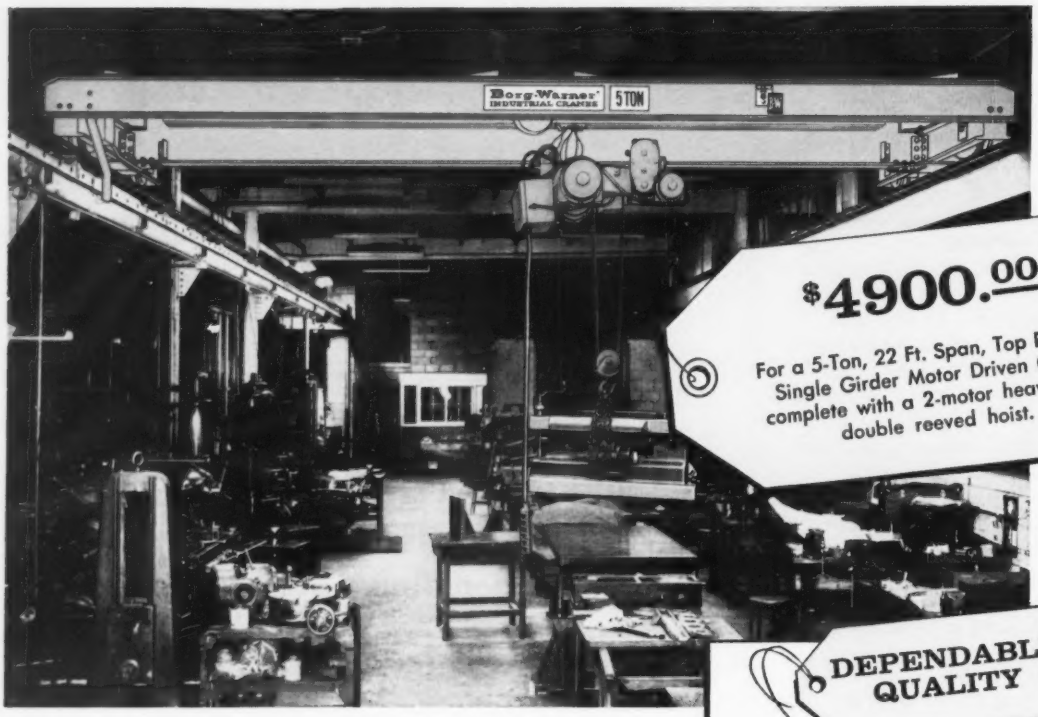
A lot of handling was necessary to insure part quality. After laboratory tests, the tubing was put into stock, sent out for broaching, then stored when it came back.

• **Tested First**—Before accepting mill burnished tubing, the company tried it out in sample relays which were put through a life test. They were subjected to a minimum of 30 million cycles (at 200 per minute). After 33 million to 35 million cycles without failure, the production changeover was made. The tubing is made by Alloy Tube Div., Carpenter Steel Co., Union, N. J.

Machining and handling of the housing are now simplified to cutoff, chamfering, and counterboring of both ends. Tubing ends are welded during assembly, no subsequent annealing operation being necessary. Parts are inspected after cutoff, after chamfering and boring, and before assembly.

PRODUCTION WISE and COST CONSCIOUS!

Borg-Warner quality assures you of top value in every capacity, performance and price range



$4900.00

For a 5-Ton, 22 Ft. Span, Top Running Single Girder Motor Driven Crane complete with a 2-motor heavy duty double reeved hoist.

PRODUCTION WISE

There's no room in this busy shop area for aisle-filling floor-type handling equipment. But, an economical Borg-Warner 5-Ton Crane System transports materials and work swiftly, smoothly and quietly with minimum interference to production.

COST CONSCIOUS

Borg-Warner engineers and production men have made extensive use of interchangeable, standardized components resulting in real savings for you. You get more crane, more performance and greater dependability, for a smaller investment.

If you are planning on expansion or modernization, it will pay you to find out how Borg-Warner Industrial Cranes can supply you with the best values in overhead materials handling equipment.

DEPENDABLE QUALITY

- Full 5-ton rating with ample reserve capacity.
- Heavy duty Borg-Warner Motor Reducer Bridge Drive with integral fluid coupling.
- Heavy duty double reeved close headroom hoist.
- Heavy duty forged steel wheels.
- All welded, jig assembled, jig bored end trucks.
- Long life precision ball and roller bearings.
- Precision assembly of girder and end trucks with fitted bolts in reamed holes.
- Outrigger machinery girder construction.
- Full magnetic push button control.

ADVANCED DESIGN

The N-TRMD illustrated is a typical Borg-Warner Industrial Cranes Top Running Single Girder Motor Driven Crane. The precise equipment to meet your specific needs is available. Consult with Borg-Warner Industrial Cranes engineers.

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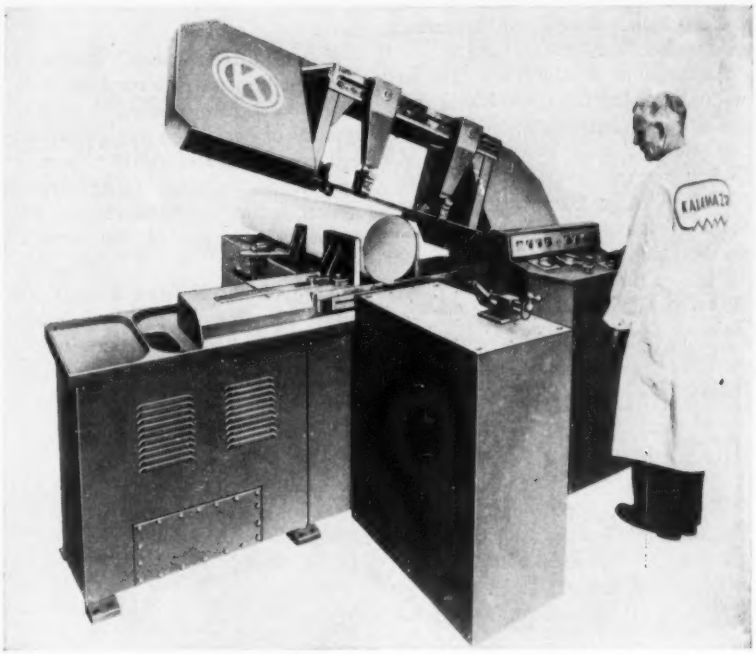
Horizontal Bandsaw Holds Down Tool Costs

TOOL COST per square inch of cutting is less with the Model 14A horizontal bandsaw machine than with other cutoff methods, says the manufacturer.

Called the Big K, the machine has a hydraulically driven blade which instantly and automatically varies torque with changes in cutting conditions. Clockwise blade rotation reduces tooth shock when entering the workpiece, increasing blade life.

Positive cutting pressure is maintained at all times at a selected constant rate. The saw has a capacity of 14 x 24 in.

To permit quick adjustment of blade tension, frame feed, and blade speed, all controls are grouped at a central console. The console is stationed at a comfortable working height so the operator is kept safely away from the frame and blade.



Other features: Dual movable vise jaws; adjustable blade tension, vise jaws, and cutting pressure; grooved blade wheels for different blade widths; double opposed rotary blade cleaning brushes; a center cutting position.

For more information, *write* Machine Tool Div., Kalamazoo Tank & Silo Co., Kalamazoo, Mich.

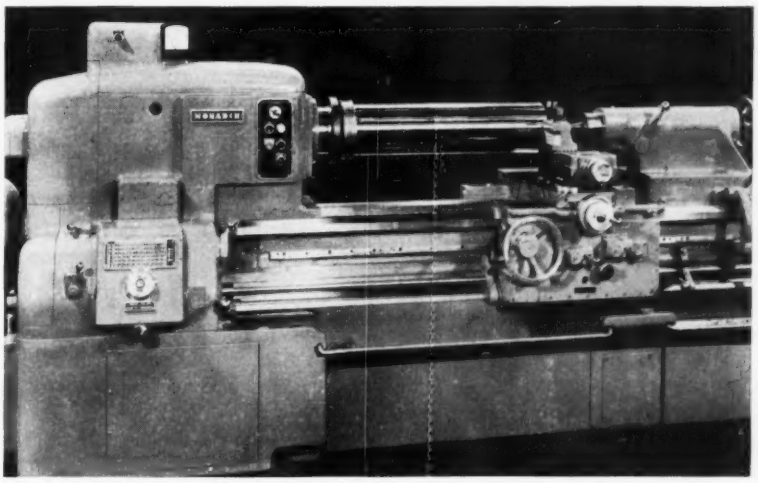
Finishing Lathe Cuts Grinding, Polishing Time

DESIGNED to finish turn rolls, cylinders, tubes, and like parts to a critical microinch finish at surface speeds above 2000 sfpm, the Series 62 lathe eliminates or drastically reduces grinding and polishing time.

Taper is held within 0.00025 in., concentricity to less than 0.0005 in.

Low carbon steel, hydraulic cylinder tubes can be turned at 1500 sfpm to a 20 to 25 microinch finish. Copper plated rotogravure cylinders can be diamond turned to a 6 microinch finish. High cutting speed saves time in turning; polishing time is reduced by as much as 2 to 3½ hours per cylinder.

The variable speed power unit



drives direct to the spindle through a PolyVee belt. No intermediate shafts or gears are in the headstock which eliminates any effect of gearing on the surface finish of the part. Spindle speeds can be selected over a constant torque range of 100 to 2200 rpm. Speeds are indicated on an electrical tachometer.

Adjustment of the tool can be made in increments of 0.0001 in. through a dial indicator on the bottom slide. Swing over the ways is 25 in.; swing over the cross slide, 16 in. Center distance is 72 in.; center distances of 96 and 120 in. are optional.

For more information, *write* Monarch Machine Tool Co., Sidney, Ohio.

Drive Unit Provides up to 1000 Indexes a Minute

SPEEDS up to 1000 indexes a minute are possible with this drive unit. Output torque ratings of 1100 in.-lb and upward are available.

The high torque output of the indexing drive provides extreme versatility since the unit can handle a high combined load of inertia and work done during movement.

The high speeds of which the precision drive is capable are made practical by a modified trapezoid acceleration which gives jerk-free start and stop of the motion and a minimum force on the cam followers. (The drive assembly uses a hardened and ground tool steel cam with preloading of roller bearing followers.) Indexing accuracy is held to within 0.001 in. on a 12 in. circle.

For more information, *write* Commercial Cam & Machine Co., 455 N. Artesian Ave., Chicago 12, Ill.

Abrasive Cutting Machine Has Oscillating Wheel

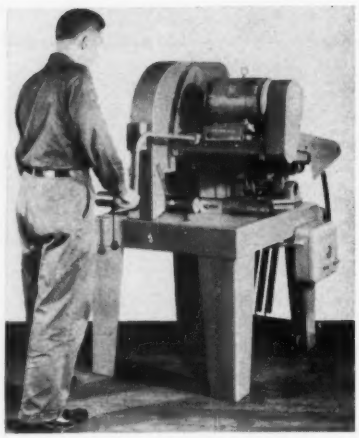
PRACTICALLY all metals (including cold and hot rolled steel, alloy and carbon steel, stainless steel, cast iron, and nonferrous metals) can be cut with the Model 2-A Sever-All dry abrasive cutting machine.

It is designed for heavy duty work in metalworking plants, steel mills, warehouses, and maintenance shops. Capacity is up to 4 in. solids, round or square; 5½ in. OD pipe or tubing; 6 x 1 in. flat stock; 6 in. angle iron; and 8 in. channels.

Work is manually fed into the unit.

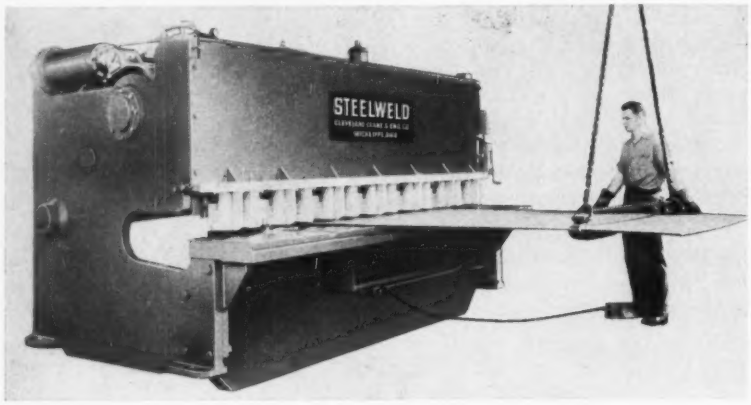
Power driven wheel oscillation enables the unit to sever large cross sections of material with a fine quality of cut. The oscillation also reduces the arc of contact between and work, provides faster cutting action, reduces operator fatigue, and increases the life of the abrasive wheel.

Rate of cut is from 2 to 3 seconds per square inch of metal. Example: A 4 in. square bar of



hardened steel can be severed in about 45 seconds.

For more information, *write* Allison Campbell Div., American Chain & Cable Co. Inc., Bridgeport 2, Conn.



Metal Shears Operated Hydraulically

DECREASED maintenance, ease of knife adjustment, and positive overload protection are designed into a line of Steelweld metal cutting shears.

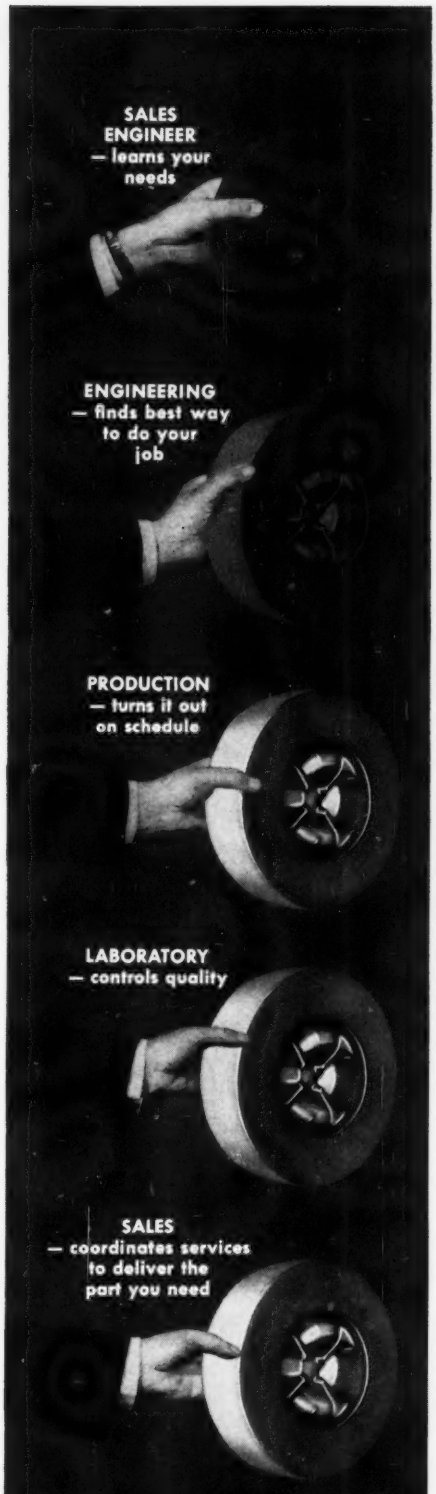
Powered by a single hydraulic cylinder, the blade is pivoted and turns in a curved path. The single cylinder applies constant force throughout the cutting action, a cross shaft linking the piston rod to the two ends of the blade.

The use of one cylinder simplifies the hydraulic circuit. No special circuits are needed to keep the blade level.

The single cylinder design provides an important bonus advantage: A second, higher speed for lighter thicknesses. Material up to and including 65 per cent of the rated thickness is cut at double the downstroke full-load speed. The hydraulic circuit automatically changes to a slow speed full-load capacity when required.

Knife clearance can be adjusted to suit different plate thicknesses. It's done by turning a hand crank at the front of the machine. A cutting stroke adjustment is provided to change the upper and lower limits of the blade travel to suit the work. If you try to cut material for which the machines are not suit-

(*Please turn to Page* 192)


SALES ENGINEER — learns your needs
ENGINEERING — finds best way to do your job
PRODUCTION — turns it out on schedule
LABORATORY — controls quality
SALES — coordinates services to deliver the part you need

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that helps you DEVELOP and GET the part you need

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The forging in the illustration at left is a missile part, meeting requirements of the exacting kind encountered for rocket, missile, and aircraft production.

T & W Technique makes possible production of many parts unusual in contour or tolerance, from various alloys. Above is a stainless steel stamping a tank 25" x 18½" x 12½".

Write for COUNTDOWN COORDINATION, showing how T & W facilities can help you.

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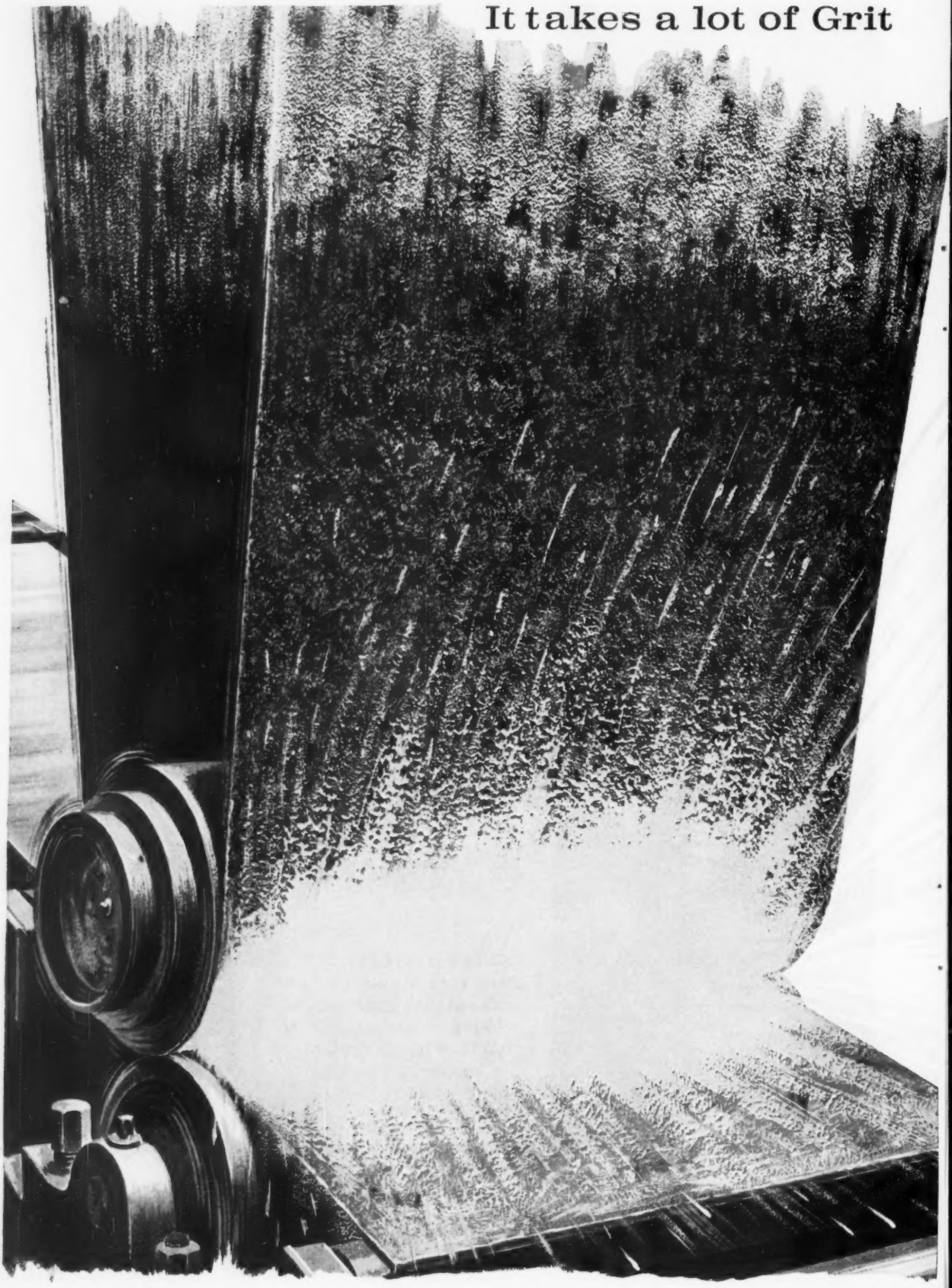
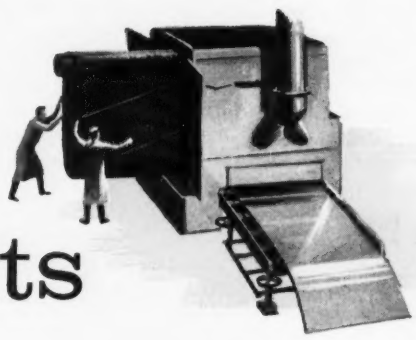


to keep industry growing



Wide belts are the latest fashion in industry

The many jobs they do are spectacular—remove stock to tolerances of 0.0002, polish large sheets of steel, polish an entire plywood door at a single pass!

Working closely with tool designers, Behr-Manning engineers have developed cool-running, low-cost abrasive belts to grind and polish large areas and difficult shapes. From the most modern research laboratories and manufacturing facilities in the world comes an endless variety of coated abrasive belts and new techniques to speed production and lower costs in every industry.

Constantly exploring and developing new products and methods, Behr-Manning scientists and engineers have contributed over 61 important new products and more than 302 major product improvements . . . such as Electrostatic Coating, Garnet Paper, Durabonded®, Openkote®, Tufbak® for wet sanding and No-Fil® for dry sanding.

In one year, Behr-Manning makes over 180,000,000 sheets of sandpaper and over 20,000,000 abrasive belts—plus millions of discs, rolls and other coated abrasive specialties.

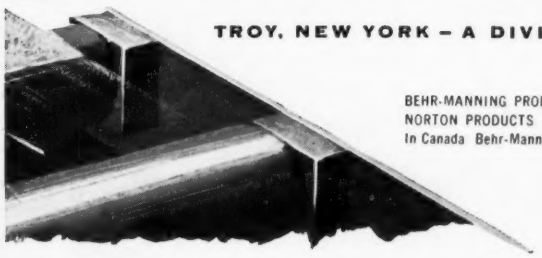
®Registered Trade Mark

The sign of the Bear means a better product . . . and better production

BEHR-MANNING CO.

TROY, NEW YORK – A DIVISION OF NORTON COMPANY

NORTON ABRASIVES



BEHR-MANNING PRODUCTS Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes
NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals
In Canada Behr-Manning (Canada) Ltd., Brantford For Export, Norton Behr-Manning Overseas Inc., Troy, N.Y., U.S.A.

ed, no damage results. The overload protection is uniform throughout the entire shearing stroke.

For more information, *write* Steelweld Machinery Div., Cleveland Crane & Engineering Co., Wickliffe, Ohio.

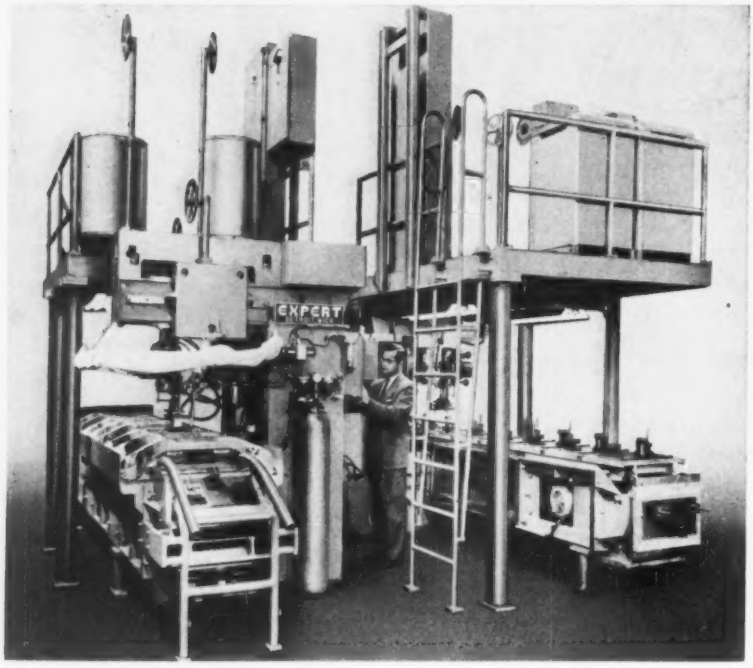
Rust Preventive Film

METAL PARTS to be stored indoors for long periods can be protected with Houghton Rust Veto 377.

The product can be applied to wet surfaces because it displaces water. The preventive creeps under surface moisture coating the metal with a 0.0003 in. film which protects it against oxidation.

The film is not wiped off by handling. Treated parts need not be cleaned before lubricating because the preventive is compatible with mineral oils. Test results are cited in which the product withstood the 100 per cent humidity test for 30 days and 24 hours in a 20 per cent salt spray.

For more information, *write* E. S. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.



Transfer System Ups Welding Production

THE Expert over and under transfer system improves the efficiency of automatic transfer machines and automated welding machines. Compared with a rotary dial type machine, the transfer system reduces floor space requirements, increases production, and facilitates material handling operations, says the manufacturer.

The transfer system utilizes the Expert cam index drive, which consists of a rotating cam with a mathematically derived continuous index and dwell groove accurately machined around its periphery. The motor driven cam indexes the pallets of the over and under unit through cam followers mounted on the underside of each pallet.

One model of the over and under design is incorporated in an automated welding machine that

(*Please turn to Page* 196)

No heat distortion and more power in the cut with G&L table and bed construction

G&L vertical boring mill tables ride on a large preloaded, tapered roller center bearing and one or two antifriction roller bearing tracks. The center bearing prevents misalignment of table and work due to radial thrust. Preloading of the bearing eliminates need for clamps and hold-down devices to prevent table tilting during machining.

Use of single or double roller tracks depends on loads—a second track increasing capacity fivefold. For example, the 12-ft VBM readily handles 125-ton workpieces across its entire speed range.

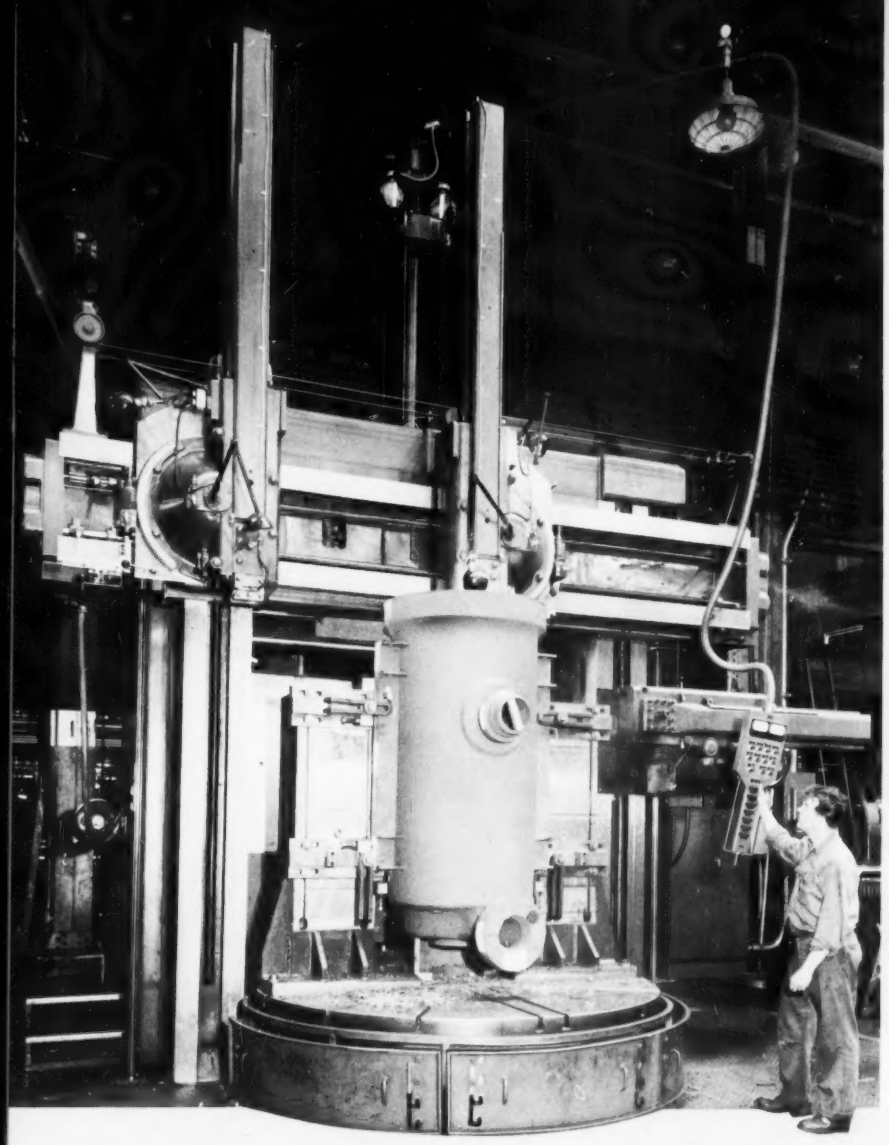
Unitized bed and transmission assure a level, smooth-running table and eliminate need for a pit because internal adjustments can be made from the top.

All this adds up to less friction, less heat, freedom from distortion, and more power in the cut.

symbol for machining cost reduction

GIDDINGS & LEWIS

GLF-111



GIDDINGS & LEWIS

Standard sizes
54-inch through 20-foot

Photo courtesy Allis Chalmers Manufacturing Co., West Allis, Wisconsin

G&L roller bearing table tracks speed up precision machining on any size workpiece

You can turn out any job faster on a Giddings & Lewis vertical boring mill because of the table and bed construction described at the left.

You can run at higher speeds or heavier feeds or both because more horsepower is put to work at the tool and less is consumed in turning the table. The low friction and resulting low heat build-up permit you to run any size workload *continuously* without loss of accuracy.

Efficient, accurate operation at highly increased speeds permits use of carbide and ceramic tools, even when turning small-diameter work.

Complete reliability of design has been exhaustively proved—no Giddings & Lewis antifriction table track has ever failed in service.

For complete information on the antifriction table and the many other features of this productive, completely pendant-controlled machine tool, call your Giddings & Lewis distributor or write for Catalog VBM-4.

GIDDINGS & LEWIS MACHINE TOOL COMPANY
Fond du Lac, Wisconsin

Giddings & Lewis manufactures: vertical and horizontal boring machines, vertical turret lathes, planers, planer mills, contour milling machines, die sinking machines, drilling machines, numerical and tracer control systems, boring tools and related items, and machine tool accessories.

low friction · high finish

Stuart's CODOL

liquid grinding compound

Stuart

Grinding experts will tell you there's only one way to get a slick surface finish without going to extremely fine grit wheels or a straight grinding oil—and you don't have to give up wheel life or cooling action to get it.

That is by utilizing the balanced lubricating and scrubbing action of a water-mix like Stuart's Codol liquid grinding compound. For Codol's balanced formula provides the high surface finish advantages of a straight oil . . . in colloidal form . . . plus the cooling capacity of water.

Extremely fine oil particle size results in a near-transparent solution. Codol is not an opaque emulsion like most soluble oils . . . yet, it has none of the machine maintenance disadvantages of transparent compounds.

Use Codol for fine-finish grinding when you want to keep wheel inventory costs at a minimum and production efficiency right at peak.

Read on the opposite page how Codol helped solve a tough finish problem at International Business Machines Corp.

Stuart's Codol combines lubricity with detergency, for fine-finish grinding

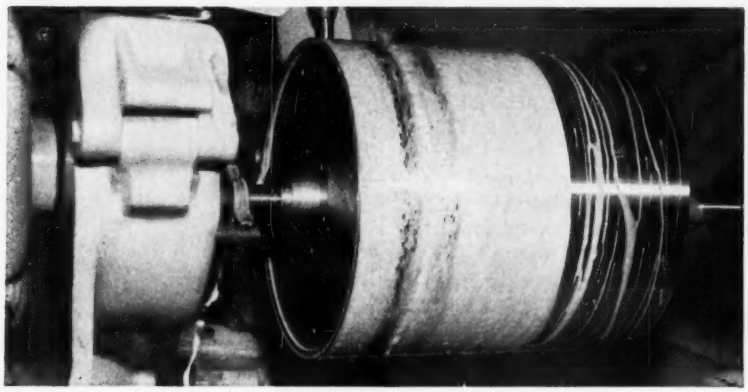
Extremely fine oil particles in Codol serve to reduce the clearance between wheel grits and make a grinding wheel act softer.

Standard wheels grind like fine-grit wheels—produce mirror finishes that cannot be duplicated if you rely strictly on grit action. Thus, greater wheel versatility reduces your inventory costs and simplifies wheel stocking problems. But, real benefits come from improved performance of the machine and wheel ... as well as from improved product quality.

Codol keeps a wheel open and free-cutting. It's a real detergent. You don't have to worry about heat-stressing. ▼

Stuart's straight grinding oils and new, highly detergent, petrochemical solution, Hi-D—your Stuart representative can provide the grinding fluid best suited to your particular work.

***Proof of performance**—At International Business Machines Corp., the problem for Codol was preparing the plating surface on 10 in. OD "memory units" (below) used in data-processing equipment. To produce a surface free of roughness or dimensional inaccuracy, the monel drums are precision ground, removing .008 in. stock and holding concentricity within .00025 in. Stuart's Codol provides the lubricity and high detergency required for producing a smooth, mirror-like finish, plus the cooling capacity required for accurate stress-free grinding. After grinding, the drums are copper-plated and turned with a diamond point.*



Yet, Codol will not remove way lubricant or attack the finish of machine tools. This adds up to fine finishes, good wheel life, less downtime for dressing wheels, and lower machine maintenance.

With Codol to fill the gap between Stuart's straight grinding oils and new, highly detergent, petrochemical solution, Hi-D—your Stuart representative can provide the grinding fluid best suited to your particular work.

(Complete details are available on this application—ask for Bulletin #8.)

Call your Stuart representative for expert advice on grinding fluid problems—and remember, it's Codol when you want a slick finish.

Stuart **Productive Lubrication**

(Phone Stuart Representative listed at right)

D. A. STUART OIL CO., LIMITED

2727 South Troy Street, Chicago 23, Illinois • Phone: Bishop 7-7100

CANADIAN D. A. STUART OIL CO., LIMITED, P.O. Box 430, 43 Upton Road, Scarborough, Ontario, Canada

ATLANTA, Georgia
Henry E. Perkins
275 Danbury Lane
BLackburn 5-6926

BAYONNE, New Jersey
D. A. Stuart Oil Co., Ltd.
P. O. Box 137
HEmlock 7-0151

CINCINNATI 2, Ohio
c/o Queen City Warehouses, Inc.
42-56 Main Street
PArkway 1-3731

CLEVELAND 13, Ohio
D. A. Stuart Oil Co., Ltd.
1730 Train Avenue
PRospect 1-7411

DALLAS 35, Texas
The Royal Supply Company
6626 Maple, P. O. Box 35374
FLeetwood 1-3927

DAYTON 2, Ohio
c/o Union Storage Company
10 S. Conover Street
BAldwin 6-1871

DETROIT 4, Michigan
D. A. Stuart Oil Co., Ltd.
8350 Military Avenue
TYler 7-8500

ENGLEWOOD, Colorado
Western Oil Supply
3275 S. Santa Fe Drive
SUnset 1-1721

FORESTVILLE, Connecticut
D. A. Stuart Oil Co., Ltd.
c/o Paul's Cartage
215 Fredericks St.
JAckson 7-1144

HARTFORD 13, Connecticut
D. A. Stuart Oil Co., Ltd.
410 Asylum Street, Rm 336
JAckson 7-1144

HOUSTON, Texas
Ada Oil Company
6910 Fannin, P. O. Box 844
JAckson 6-1911

INDIANAPOLIS 7, Indiana
D. A. Stuart Oil Co., Ltd.
c/o Merchandise Whse. Co., Inc.
1414 South West Street
MElrose 2-2525

KANSAS CITY, Kansas
Interstate Oil Co.
87 Shawnee Avenue
DRexel 1-3470

LOS ANGELES 22, California
Los Angeles Oil & Grease Co.
2313 Yates Avenue
RAymond 3-1208

MINNEAPOLIS 4, Minnesota
The Satterlee Company
2200 E. Franklin Avenue
FEderal 3-5264

PHILADELPHIA 35, Pennsylvania
D. A. Stuart Oil Co., Ltd.
Wingate & Hagerman Streets
DEvonshire 8-6100

PORTLAND 4, Oregon
J. E. Haseltine & Co.
115 S.W. Second Avenue
P. O. Box 3342
CApitol 8-7511

ST. LOUIS 10, Missouri
Jenkin-Guerin Inc.
4480 Hunt Avenue
OLive 2-2905

SAN MATEO, California
Bay City Oil Co.
968 S. Bayshore Blvd.
DIamond 3-2090

SYRACUSE, New York
c/o Robert M. Haley Warehouse
404 N. Midler Avenue
Box 61, Eastwood Sta.
HOward 3-8647

SCARBOROUGH, Ontario, Canada
Canadian D. A. Stuart Oil Co., Ltd.
P. O. Box 430, 43 Upton Road
PLymouth 7-3227

EUROPE

SWITZERLAND, Bern
Walo v. Muhlenen
Effingerstrasse 75

BELGIUM, Brussels
Ets. Mottay & Pisart S.A., 65 rue du Lombard

DENMARK, Copenhagen-Gentofte
Firma P. V. Nordentoft, Brogaardsvaenge 1

ENGLAND, London W. 1
Amber Oils, Ltd., 11A Albemarle St.

FRANCE, Paris 17e
Dasco S.A., 2, rue Gounod

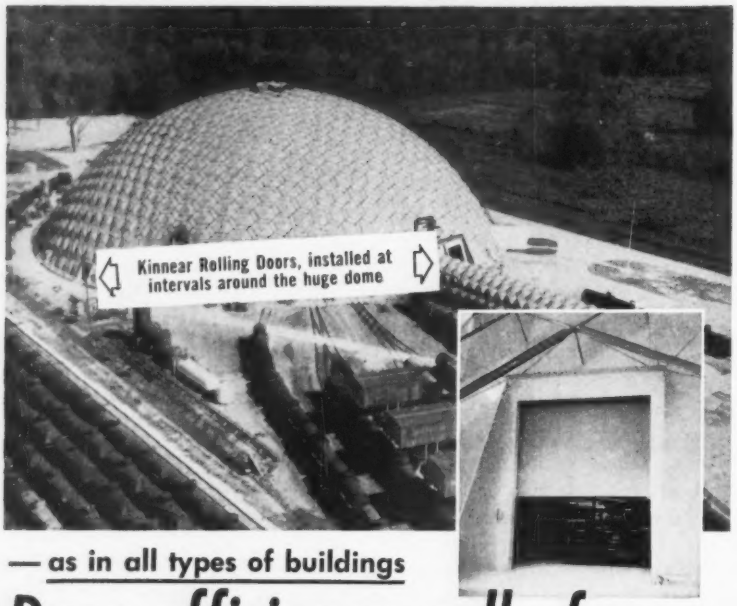
GERMANY, Frankfurt a.M.
D. A. Stuart Industrieöele G.m.b.H.
Cassellastrasse 31

ITALY, Milan
Univers S.p.A., Via Valvassori Peroni N. 47a

SWEDEN, Stockholm—Vartan
A. B. Gullander & Co., Postfack

SWITZERLAND, Bern
N. v. Muhlenen G.m.b.H., Schlosstrasse 131

Even in this ultra-modern geodesic dome—



— as in all types of buildings

Door efficiency calls for Kinnear Rolling Doors

With no internal supports of any kind, *yet big enough to enclose a football field,* this giant geodesic dome houses a railroad car repair shop of the Union Tank Car Co., in Baton Rouge, La.

And here, as in all types of buildings, Kinnear Rolling Doors provide up-to-the-minute door efficiency.

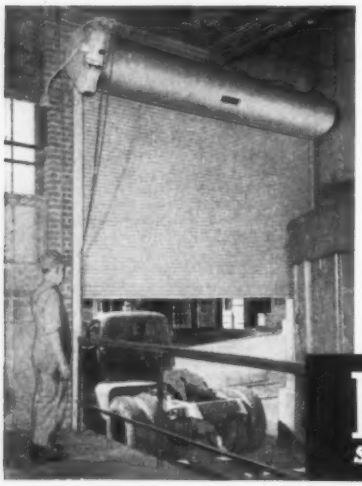
They open straight upward and clear the entire doorway, coiling compactly above the opening. Surrounding floor, wall and overhead space, *inside and outside the building* is always fully usable whether the doors are opened, closed, or in action. This promotes full use of hoist, crane, conveyor, and lift-truck equipment.

Their *continuous all-metal curtain* gives extra protection against intruders, vandals, troublemakers, wind, weather, and fire.

Every Kinnear Door is *Registered.* Full details of all parts are kept permanently in Kinnear's fireproof vaults. Parts are always replaceable. Your Kinnear doors will never be "orphans".

For maximum durability Kinnear's special hot-dip galvanizing coats the entire curtain with a full *1.25 oz. of pure zinc per square foot of metal* (ASTM standards).

Kinnear Rolling Doors are built any size, for old or new buildings, with motor, manual or mechanical operation. Write for information.



The KINNEAR Mfg. Co.
FACTORIES:
1780-1800 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

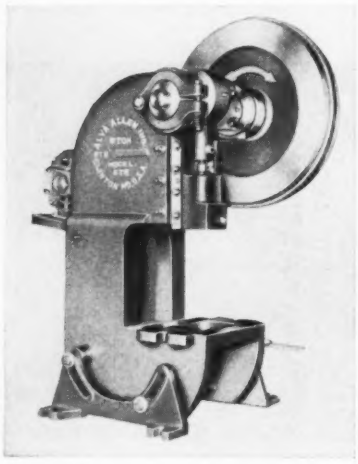
welds both sides of the bracket to an automobile front cross member at a production rate of 647 parts an hour. The machine consists of two separate over and under systems to weld the top and bottom parts of the bracket to the cross member.

For more information, *write* Expert Automation Co., 17144 Mt. Elliott Ave., Detroit 12, Mich.

Power Punch Press Has Extra Large Die Space

USE of the Allen Model BT-8, 8-ton punch press will permit fabricators to work on large parts that previously required large, expensive presses to obtain sufficient die space.

The press is available with a die space of 8½ in. shut height and 10 in. throat. It can be easily set up for any standard punch press operation, such as blanking, forming, shearing, riveting, and drawing.



For more information, *write* Alva Allen Industries, 1001-15 N. Third St., Clinton, Mo.

Ultrasonic Instrument Measures Liquid Level

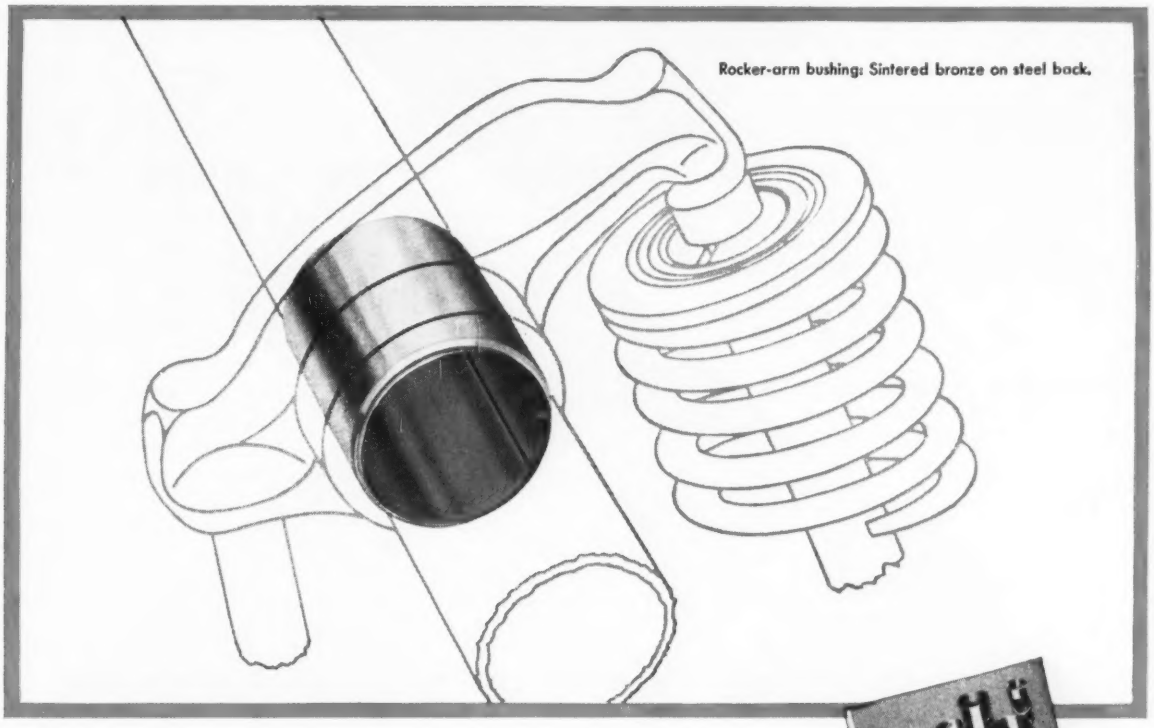
LEVEL can be measured continuously in liquid nitrogen, slurries, thick oils, fused salts, molten metals, and many other fluids by the Metasonic principle.

The ultrasonic instrument uses

Carrying the rocker-arm load . . .

FORMED BUSHINGS

SAVE SPACE—SAVE WEIGHT—SAVE COST!

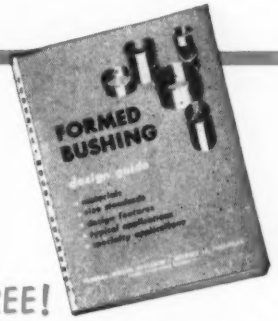


Rocker-arm bushing: Sintered bronze on steel back.

Here's a typical application in which the design engineer uses formed bushings to meet both performance and cost demands.

This rocker-arm bushing is formed from sintered bronze-on-steel strip. In fast oscillation, at 200 p.s.i. average loading, it has an average life of 5,000 hours, or 150,000 miles. Cost-wise, you will find it attractive. Space and weight are saved, with no sacrifice of strength or service life.

There are countless other applications in motor, machine and accessory design, where formed bushings deliver equal satisfaction. Let our engineers assist you. Consultation is free—no obligation.



FREE!

Bushing Design Guide, technical publication by our Engineering Department. Shows materials, size standards, design and application features. Write today!

FEDERAL-MOGUL DIVISION

FEDERAL-MOGUL-BOWER BEARINGS, INC., 11051 SHOEMAKER, DETROIT 13, MICHIGAN

Copper-Alloy Lined Bearings

Spacer Tubes

Camshaft Bearings

Precision Thrust Washers

FEDERAL Mogul SINCE 1899

we can't promise you the moon, **BUT**

Are you fed up with claims that a certain product will "cut costs" . . . "boost production" . . . "raise operating efficiency" . . . "increase your profits" . . . in short, are you being offered the moon but find yourself left on the launching pad?

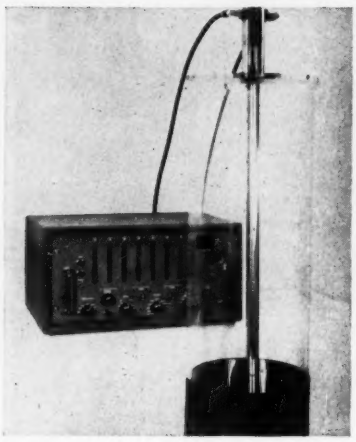
Then you'll want to consider SIMONDS HIGH SPEED STEEL METAL CUTTING BAND SAW BLADE. Here's a blade that actually will do what you want it to in terms of square inches of cutting per hour, per blade . . . in terms of resistance to wear and breakage . . . in savings in downtime for blade changing.

Here's a HIGH SPEED STEEL BLADE we know will measure up to your expectations because (1) it's designed and engineered like a fine cutting tool; it's heat treated by newly developed techniques that produce maximum tooth hardness without damaging the cutting points while maintaining the toughness and flexibility of the back; and it's flex-tested to insure trouble-free on-the-job performance including the weld and (2) report after report from tests and production cutting in large plants in many industries verify that here, at last, is a HIGH SPEED STEEL band saw blade that really works.

We can't (and don't) promise you the moon, BUT we do offer you a saw for production cutting off that will withstand high speeds and heavy feeds and give you straight, accurate cuts with a fine finish. Put a SIMONDS HIGH SPEED STEEL SAW to work for you and find out how much better it really is. Call your Simonds Distributor.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.
For Fast Service from Complete Stocks Call your
SIMONDS Industrial Supply DISTRIBUTOR

Factory Branches in Boston, Chicago, Meridian, Miss., Shreveport, La., San Francisco and Portland, Ore., Canadian Factory in Montreal, Que., Simonds Divisions: Simonds Steel Mill, Lockport, N. Y., Heller Tool Co., Newcomerstown, Ohio, Simonds Abrasive Co., Phila., Pa., and Arvida, Que.



solid metal acoustic wave guides to derive its information, especially ignoring or canceling the effect of the liquid and its properties on the accuracy of level measurement.

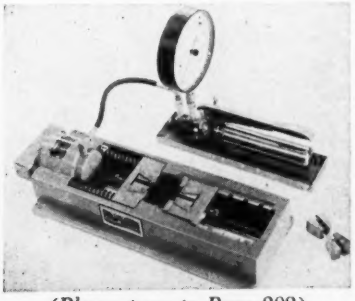
The measuring system is fully transistorized; output is either digital or continuous and adaptable to recording and control, proportioning, and blending.

For more information, *write* General Ultrasonics Co., a division of Acoustica Associates Inc., 6 Tobey Rd., Bloomfield, Conn.

Portable Tensile Testers Mount on Bench or Wall

STANDARD tensile tests can be performed on this line of testers when they are mounted horizontally, and either tensile or compression tests can be performed when they are mounted vertically. A lower compression plate is available as an accessory when compression tests are anticipated.

The tensile load is applied to the test specimen by manually operat-



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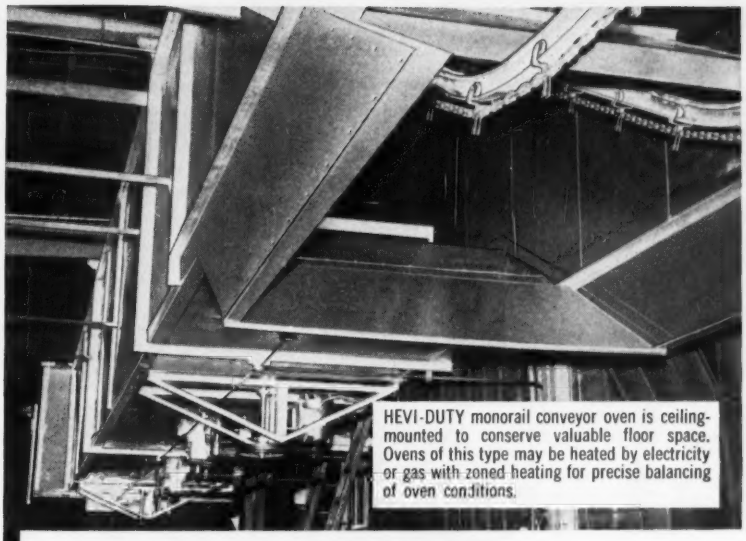


HEVI-DUTY monorail conveyor oven is ceiling-mounted to conserve valuable floor space. Ovens of this type may be heated by electricity or gas with zoned heating for precise balancing of oven conditions.

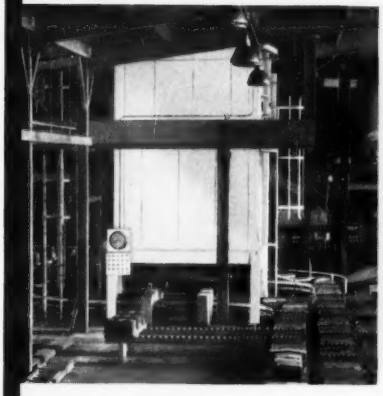
HEVI-DUTY

now offers a complete industrial oven line

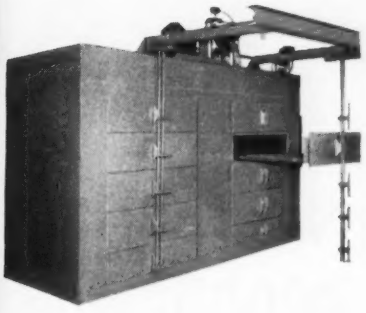
The recent purchase of the Sermax Corporation, Milwaukee, has rounded out HEVI-DUTY'S line of industrial heat processing equipment.

HEVI-DUTY now produces electric, steam heated and fuel-fired ovens. They range in size from a 15-inch diameter model for laboratory use to industrial conveyor, tower, and batch type ovens capable of handling large sand cores, castings, and fabrications.

Write for Bulletin 159 for further details.



A HEVI-DUTY tower type oven. In this oven, heating is supplied in the tower section followed by cooling in a pit below. Stabilized trays are automatically loaded and unloaded. Continuous processing with consistent results is obtained in a unit that requires minimum floor space.



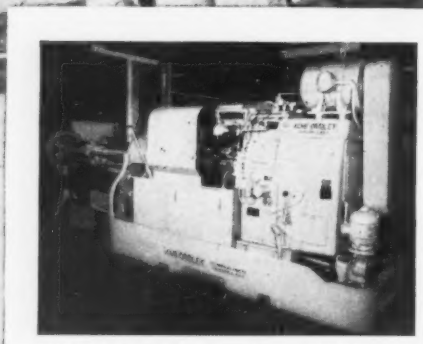
HEVI-DUTY drawer-type ovens offer flexibility for processing small batch loads. In the model shown, ten batches may be heated at the same time, yet each may be removed without disturbing the others.

HEVI-DUTY

A DIVISION OF BPC BASIC PRODUCTS CORPORATION

HEVI-DUTY ELECTRIC COMPANY, MILWAUKEE 1, WISCONSIN

Industrial Furnaces and Ovens, Electric and Fuel • Laboratory Furnaces • Dry Type Transformers • Constant Current Regulators



1⅛"-RB6 Acme-Gridley producing 266 thermometer sockets per hour at Manning, Maxwell & Moore, Inc., Stratford, Connecticut, manufacturers of industrial thermometers and gauges.

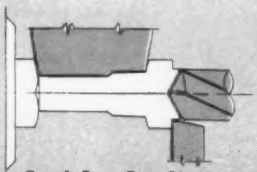
Close-up of tooling zone showing 4th and 5th position operations.

Spindle-for-Spindle

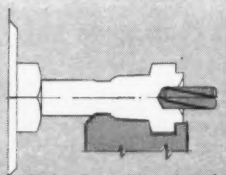
PRODUCTION INCREASED OVER 200%

for Manning, Maxwell & Moore, Inc.

12 Operations in 22 Seconds



6. Rough Form Rear Diameters —Spot Drill—Turn Front Diameter



1. Finish Form Thread and Front Diameter—Drill ⅜" Diameter

NATIONAL ACME'S "ZONE OF RESPONSIBILITY" INCLUDES ALL PHASES OF COST REDUCTION

Check YOURS . . . Then Check National Acme

Direct Costs: these include direct dollar savings as realized by Manning, Maxwell & Moore, Inc. . . . an "every day" job for Acme-Gridleys.

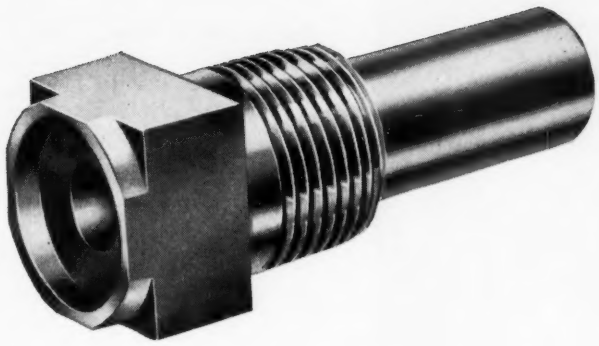
Indirect Costs: effecting important savings in maintenance, downtime, scrap reduction, tool costs, etc.

Product Redesign: teaming with your design group to take full advantage of Acme-Gridleys' cost reducing capabilities.

Direct Material Costs: our engineers provide important savings in this area by constantly matching machines and tools to modern metallurgical problems.

Make-or-Buy Reviews: in many cases our Contract Division can assume your production headaches and relieve you of immediate capital investment.

Spot Modernization: pioneering in modern tooling methods, and the flexibility of Acme-Gridleys can provide many "on-the-spot" savings.

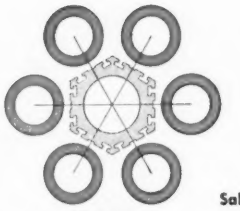


"*Cost-per-piece is substantially reduced* . . . and our increased production has enabled us to keep ahead of competition," says this manufacturer of precision industrial thermometers, gauges and valves.

"Former automatics could not keep pace with production requirements . . . many parts had to be 'farmed out', thus increasing our costs. In addition, the only downtime has been the short periods necessary for tool grinding. What's more . . . a secondary operation for deep-hole drilling was completely eliminated!"

Further benefits were realized with Acme-Gridleys' quick-change, quick-setting toolholders and wide-open tooling zones which enabled Manning, Maxwell & Moore to produce two other parts on the same machine...with only minor changes in the set-up. Add to this the extreme accuracy and flexibility of direct camming and independently operated toolslides, and you will realize why this manufacturer found his Acme-Gridleys a profitable investment.

It will pay *you* to investigate the complete story on the industry's more modern approach to cost reduction. Call, write or wire.

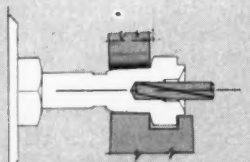


Pioneer in Circumferential Automation

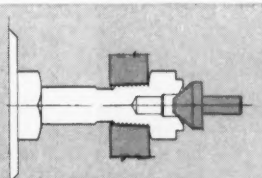
National Acme

THE NATIONAL ACME COMPANY
189 E. 131st STREET
CLEVELAND 8, OHIO

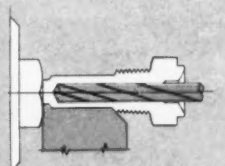
Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.



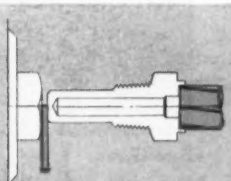
2. Shave Thread and Front Diameter—Drill 5/16" diameter partway



3. Roll Thread—Support



4. Finish Form Rear and Break-down for Cutoff—Drill 5/16" diameter remainder



5. Counterbore Large Diameter —Cutoff

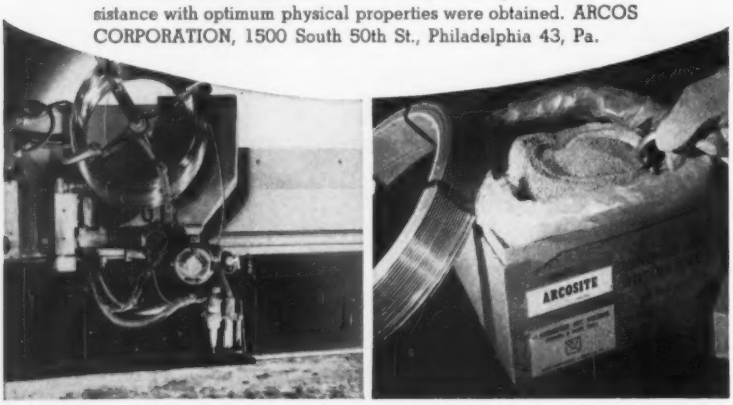
Job Report Courtesy of
Alco Products, Inc., Schenectady, N. Y.

Nuclear pressure vessel stainless clad at low cost

USE ARCOS

STAINLESS WIRE and BONDED FLUX

This "barrel" is one of several that comprise a nuclear pressurizer to operate under highly corrosive conditions. To reduce costs, Alco Products forged the shell of ASME A-336, 2—4 inch thick manganese molybdenum steel and clad the inside with stainless. The illustration shows the second pass overlay which was made by submerged arc using Arcos Chromenar K-LC (Type 308) bare wire and Arcosite S4 flux. Lower cost, and high corrosion resistance with optimum physical properties were obtained. ARCOS CORPORATION, 1500 South 50th St., Philadelphia 43, Pa.



Bare Wire Arcosite Flux

ing the hydraulic pump. The applied load is shown directly on the 8½ in. diameter gage, which includes a maximum-indicating hand.

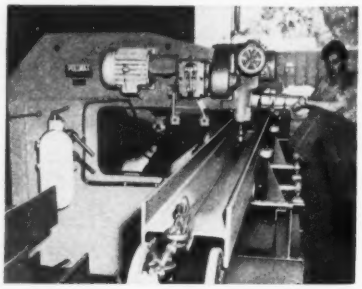
Designated the PT series, the testers are available in two general sizes. Model PT-20 units have capacities from 5000 to 20,000 lb. Model PT-40 units have capacities up to 40,000 lb.

For more information, *write* Steel City Testing Machines Inc., 8817 Lyndon Ave., Detroit 38, Mich.

Beam Splitting Machine Eliminates Manual Labor

THE PULLMAX U-10 beam splitting machine has an automatic mechanism operated by pushbutton control for starting, penetrating, and cutting of heavy metals.

In operation, the I-beam can be pulled through the machine at 10 to 20 ft per minute. The operation will leave a smooth, finished edge without distortion of the beam.



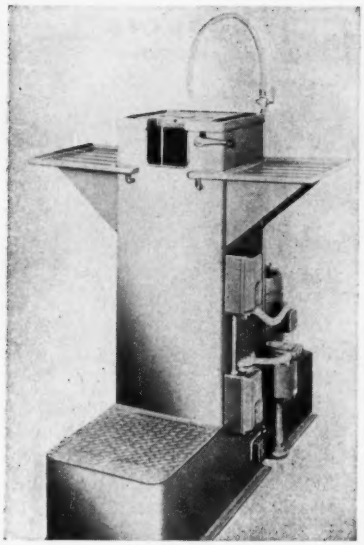
The machine can also be used for circuit cutting, straight shearing, and other standard cutting and forming operations.

For more information, *write* American Pullmax Co., 2455 N. Sheffield Ave., Chicago 14, Ill.

Low Cost Broaching Unit Does Variety of Work

MANY surface and internal broaching applications are within the scope of the Model VM215-3 vertical table top broaching machine.

In internal broaching (keyways, square, oblong, hexagonal, irregular,



splined, or round holes), the vertical pull-down action contributes to the inherent accuracy of the broaching tool. Surface broaching is handled by the use of combination workholding broach guide fixtures.

The broach is a fully hydraulic machine with a 15 in. cutting stroke, a 15 fpm cutting speed, and 38 fpm return speed. Normal power is rated at 2 tons. The worktable measures 16 x 16 in. and is clear of obstructions to accommodate all sizes of workpieces.

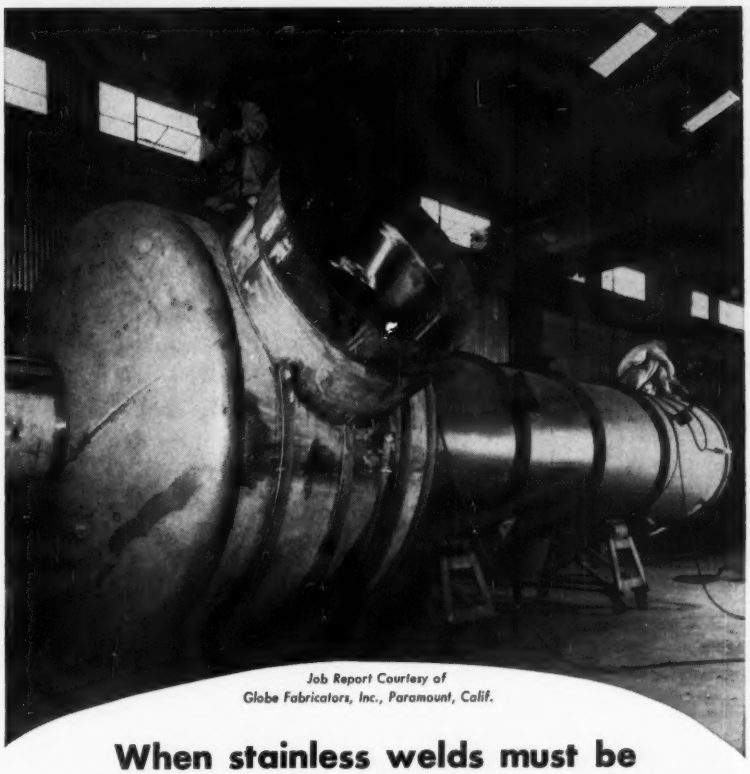
For more information, *write* Pioneer Broach Co., 6434 Telegraph Rd., Los Angeles 22, Calif.

Spring Loaded Pulleys Adjust Pitch Diameters

VARIABLE speed drives on applications up to 2 hp can be obtained with Maurey variable pitch pulleys which feature a spring tension sliding flange that automatically adjusts to different pitch diameters.

The pulley is generally mounted on the shaft of the motor or driver, and coupled with a belt with a fixed diameter pulley to form the variable speed drive.

Speed changes are made by varying the center distance between the two pulleys. As the center distance shortens, the spring loaded variable pitch pulley automatically expands its pitch diameter to take up slack in the belt, keeping it taut and firmly seated in the pulley. As the center distances lengthen between the pulleys, the pull of the belt on the



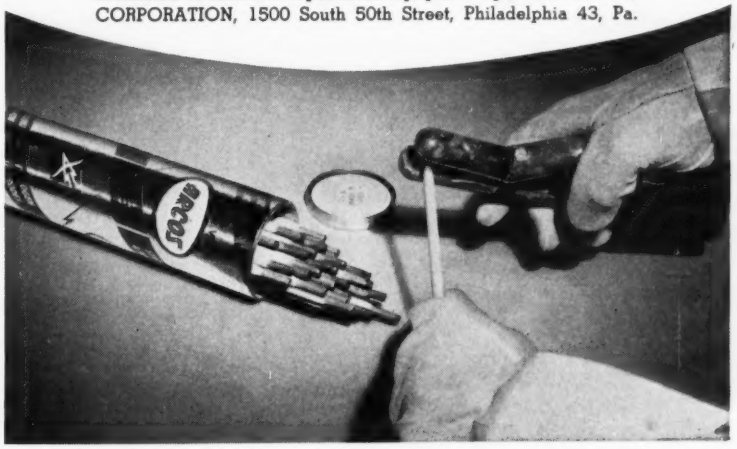
Job Report Courtesy of
Globe Fabricators, Inc., Paramount, Calif.

When stainless welds must be highly sanitary and corrosion resistant

WELD WITH ARCOS

STAINLESS ELECTRODES

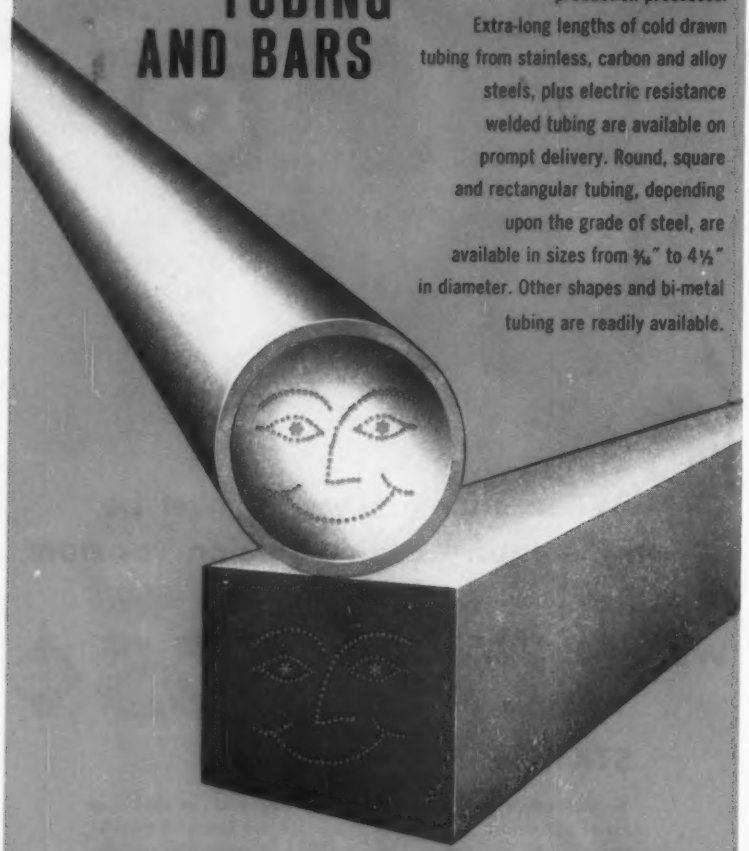
Welded citrus fruit processing equipment such as this must *resist corrosion*, must *not contaminate* the food and must be *strong*. Type 304 stainless, used for all food contacting sections, was welded with Arcos Chromend K (Type 308) electrodes. For welding the non-stainless supporting members to stainless sections, Arcos Chromend HCN (Type 310) electrodes were used. Again, Arcos electrodes provided multiple benefits that cost so little and contribute so much to dependable equipment operation. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.



DOUBLE HEADER

TUBING AND BARS

Both cold drawn steel tubing and cold drawn steel bars are made at Pacific Tube Co. with the same careful, quality-controlled production processes. Extra-long lengths of cold drawn tubing from stainless, carbon and alloy steels, plus electric resistance welded tubing are available on prompt delivery. Round, square and rectangular tubing, depending upon the grade of steel, are available in sizes from 3/16" to 4 1/2" in diameter. Other shapes and bi-metal tubing are readily available.



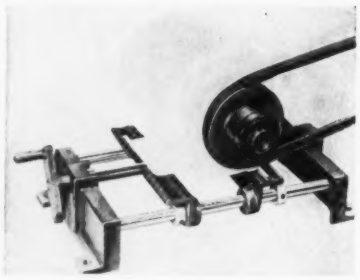
PATCO makes cold drawn steel bars in rounds from 3/16" to 4 1/2"; squares and hexagons from 3/16" to 2 1/2" in a wide range of analyses including C-1018, C-1137, C-1117, C-1045 and C-1213, and leaded steel bars in Ledloy Grades A and B; cold drawn ground and polished shafting—1/4" to 2 7/16"; turned, ground and polished and turned and polished shafting—1" to 4 1/2".

patco

PACIFIC TUBE COMPANY

5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331
Western Representative for Superior Tube Co.

NEW PRODUCTS and equipment



spring loaded pulley brings a gradual contraction of its pitch diameter.

For more information, *write* Service Div., Maurey Mfg. Corp., 2907 S. Wabash Ave., Chicago 16, Ill.

Squirrel Cage Motors

THESE Ideal high speed squirrel cage induction motors are offered in 100 to 5000 hp, 514 to 3600 rpm, frames 584-11320.

A one-piece, wraparound steel plate cover running the full length of the frame extends well below the center line of the motor on each side to provide natural dripproof protection and to increase the rigidity of the frame structure. The double end ventilation system provides maximum cooling, permitting full utilization of motor capacity.

The motors are available with silicone rubber as well as Class A, B, and H insulations.

For more information, *write* Ideal Electric & Mfg. Co., Mansfield, Ohio.

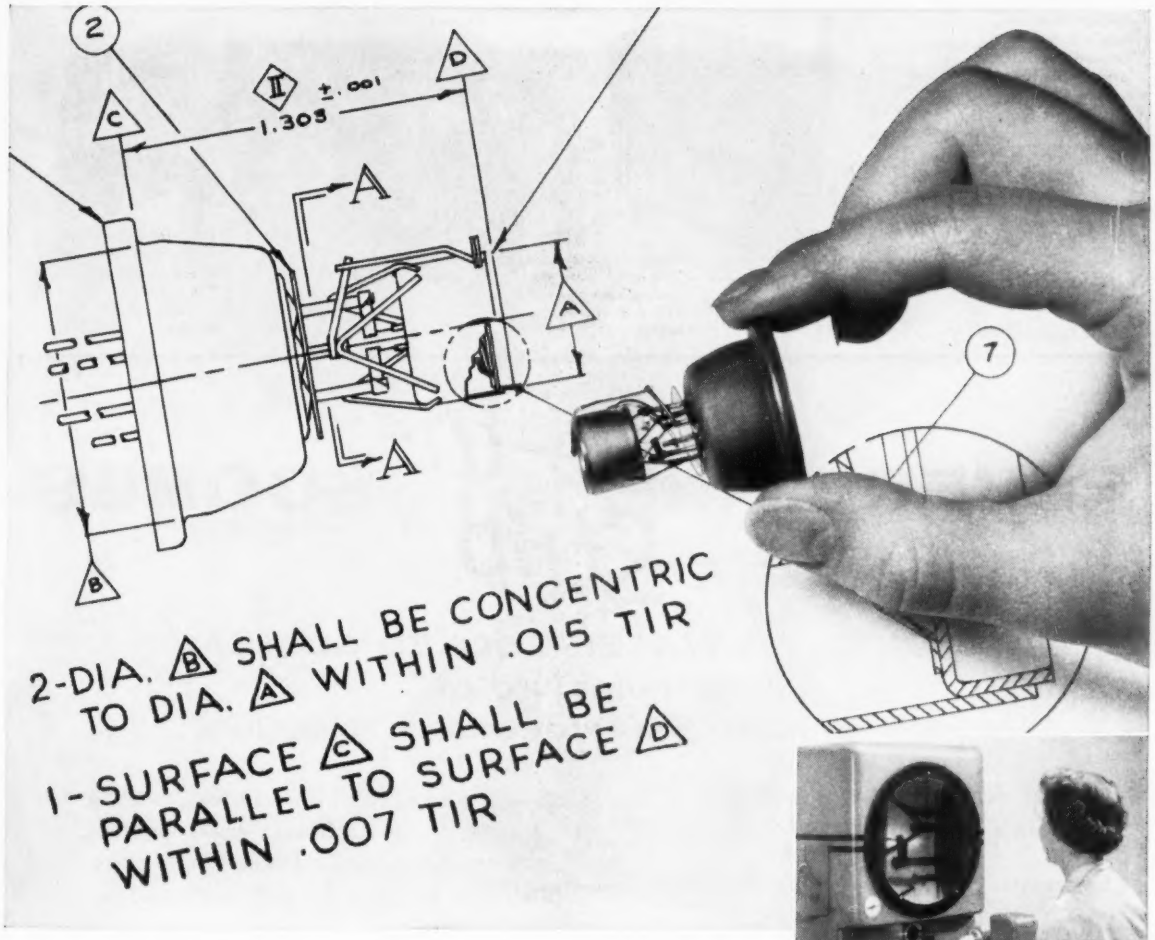
Wire Container Adaptable To Fork, Pallet Trucks

THE BASE section of the Clearview Cargotainer has been engineered to accommodate the minimum 30 in. length of lift truck forks while affording four-way and even eight-way entry. It also lends itself to pallet and platform trucks.

The Cargotainer is a welded wire fabric container for handling all types of material. It affords such advantages as self-cleaning, collapsibility, and firm stacking.

Capacities of the Clearview mod-

(*Please turn to Page* 208)



"We can cut out up to 20 gaging operations on delicate parts like this."

"Many times, with a single chart and fixture on our Kodak Contour Projector, we can quickly inspect several complex part dimensions at a single pass. This cuts gaging operations and costs to a fraction of the cost of separate gaging checks," says Varian Associates of Palo Alto, Calif., makers of precision electronic parts and equipment.

No contamination of or pressure on delicate parts (a light beam exerts no pressure, causes no wear); high-speed, accurate inspection of close-tolerance dimensions; few mechanical operations . . . these are only some of the reasons why manufacturers like Varian find optical gaging with the Kodak Contour Projector the most practical solution to many inspection problems.

You get more with a Kodak Contour Projector. You get greater *working distance*—8″ of clearance for parts and fixtures. Especially important at high magnifications.

You get more brilliant, more uniform *illumination* over the entire screen area—at all magnifications.

You get highly *accurate images* even at the critical outer edges of the screen area.

You get *upright images* of all inspected parts for easier reference.

These and other features of the Kodak instrument make it more efficient and more valuable to you. Read about them by writing for the booklet, "Kodak Contour Projectors."

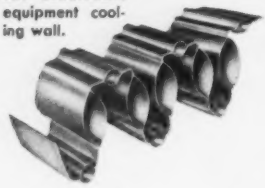
SPECIAL PRODUCT SALES

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

THE KODAK CONTOUR PROJECTOR

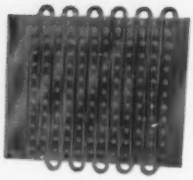
Kodak
TRADE MARK

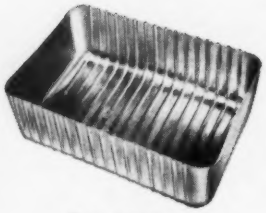
Section of Aluminum Tube-In-Strip combining refrigerant passages with air cooling for electronic equipment cooling wall.



Copper Tube-In-Strip used as a combustion chamber for water heater.

Copper Tube-In-Strip with return bends attached to produce a cooling plate.





This electronic cooling case of Revere Aluminum Tube-In-Strip was inflated after drawing.

REVERE *Tube-In-Strip* SCORES

NOW USED AS WATER-COOLED BUS BAR in manufacture of General Electric Semiconductor Rectifiers

HAS THESE 4 BIG MONEY-SAVING ADVANTAGES

1 Because it is a homogeneous mass Revere Tube-In-Strip eliminates the possibility of leaks.

2 User is able to obtain more efficient cooling.

3 If user finds it necessary to change cells it can be done without draining the system.

4 Revere Tube-In-Strip enables user to have a completely sealed system, thus eliminating O-rings or gaskets.

The use, by General Electric, of Revere Tube-In-Strip as water-cooled bus bar is still another of the myriads of ways this revolutionary product can be applied in industry.

The unique thing about Revere Tube-In-Strip is that it is a solid piece of metal, not two strips welded, brazed or bonded together. You buy strip, fabricate it as you wish, stamping, bending or forming it, and then as a final operation inflation expands the integral channels into tubes. Expanding in the open, the tubes are round; by expanding into dies, the tubes can be made rectangular, fluted, half-round, hexagonal, etc.

Revere Tube-In-Strip saves on first cost, and in fabrication. New and improved designs are made possible. The web between the tubes conducts heat faster. The vastly increased structural strength means you can use lighter gauges, saving in weight and price.

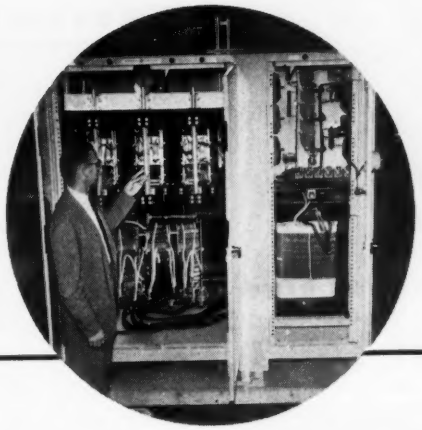
Revere Tube-In-Strip is available in Copper, Copper-base alloys and Aluminum alloys. The Revere Technical Advisory Service and the Research and Development Department will gladly collaborate with you in taking full advantage of this marvelous new material.

REVERE COPPER AND BRASS INCORPORATED

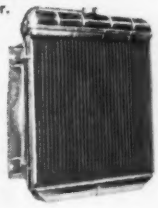
Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Rome, N. Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N. Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

Copper Tube-In-Strip spiral containing both water and refrigerant passages for increased cooling efficiency.



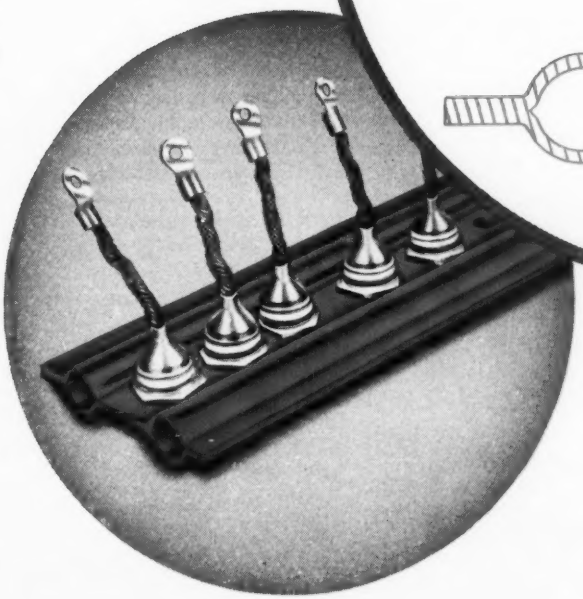
Copper Tube-In-Strip and copper fin assembly for automobile radiator.



Copper Tube-In-Strip and finned stock assembled and then inflated into automotive air conditioning coil.

ANOTHER TRIUMPH!

PHOTO IN CIRCLE ABOVE SHOWS water-cooled semiconductor power rectifier design with integrally mounted transformer as made by General Electric Company. Rated 150 volts, 4000 amps., d-c, it is used for copper refining.



(Above) **CROSS SECTION** of water-cooled bus, featuring improved cooling method. Dual, leak-proof water passages are formed in solid bus, made from Revere Tube-In-Strip, without the need for welding or brazing. They are located on each side of a section of bus to which silicon cells can be bolted without penetrating the coolant passages.

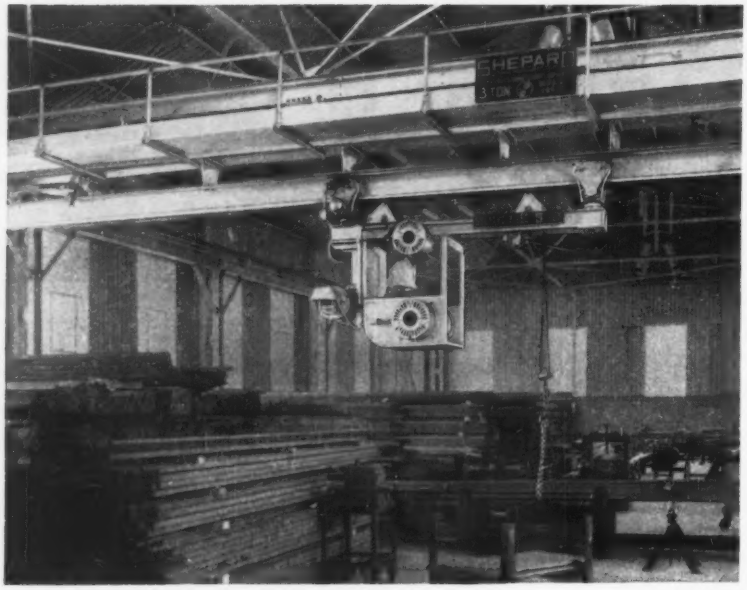
(Left) **OVERALL VIEW** of new sealed liquid-cooled bus illustrating manner of mounting several silicon rectifier cells. Unique "dry" mounting permits installation of cells without draining liquid from bus. Cells are individually attached to the bus with threaded stud and nut, simplifying the mounting of a cell, and making it unnecessary to disturb any of the other cells on the bus.

SHEPARD NILES

Monorail Hoist

TRANSPORT MATERIALS

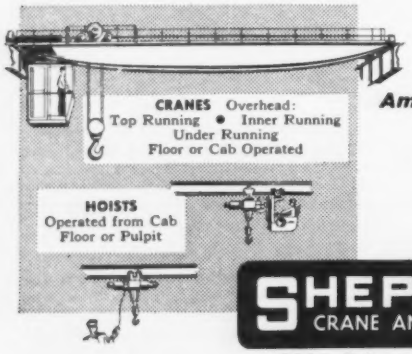
...by the most direct route



WHY MOVE MATERIALS around men and machines?

Transport them directly there, through the air. A Shepard Niles Monorail Hoist and Transfer Crane will put load handling overhead where it will function safely, swiftly, at low cost.

Let us show you the complete line of Shepard Niles hoists available for constant or intermittent service. Choose from light, medium or heavy duty hoists, equipped with either cab or floor controls. Offered in fast, medium or slow speeds.



● Send for latest Monorail Hoist Bulletin . . . ask to have a Shepard Niles representative assist you in selecting a hoist best suited for your plant.

America's Most Complete Line

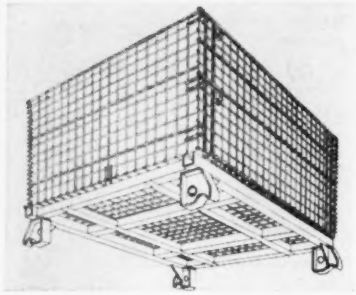
of Cranes and Hoists

Since 1903

SHEPARD NILES
CRANE AND HOIST CORPORATION

2380 Schuyler Ave., Montour Falls, N.Y.

NEW PRODUCTS and equipment



el range from 500 to 6000 lb. It is constructed of 2 by 1¾ in. channel on the long sides, and 2 by 1½ in. channel on the short sides. The wire fabric is cold drawn, 2 gage steel wire with welded intersections forming 2 in. mesh.

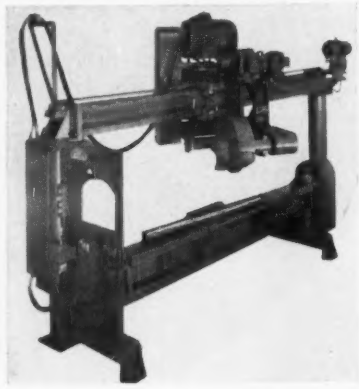
For more information, *write* Tri-State Engineering Co., Washington, Pa. .

One-Man Billet Grinder Holds and Turns Work

THIS semiautomatic billet grinder takes billets or slabs up to 12 in. wide by 12 in. thick in lengths up to 20 ft.

The pushbutton controls are simple and easy to operate, and are located at the operator's station which is protected by a metal shield. An angle wheel, driven by a 40 hp motor, grinds with a constant floating pressure. The machine holds and turns billets and easily grinds corners.

The table rotates 360 degrees. It has billet flippers, mechanical clamps, and stops. It greatly minimizes handling and permits the billets to be mechanically flipped and



a new mark

for first quality established in 1910

We have adopted a brand-new trademark, and we hope you like it! • Some of us found it hard to give up our well known tool-in-hand design, which had served faithfully for decades as the insigne of First Quality in tool steel. But times change, and a tool bit no longer represents us. • Our new trademark is for Vanadium-Alloys Steel Company's continually widening range of fine steels—for tools, dies, ultra-high strength structural applications and many other uses. We trust you'll come to know this new mark well, as the sign of "the best obtainable" in the most highly developed steels of our time.

Vanadium-Alloys Steel Company
LATROBE, PENNSYLVANIA

DIVISIONS: Anchor Drawn Steel Co. • Colonial Steel Co. • Metal Forming Corporation • Pittsburgh Tool Steel Wire Co.
SUBSIDIARIES: Vanadium-Alloys Steel Canada Limited • Vanadium-Alloys Steel Societa Italiana Per Azioni • EUROPEAN ASSOCIATES: Societe Commentryenne Des Aciers Fins Vanadium-Alloys (France) • Nazionale Cegne Societa Italiana (Italy)

AMERICAN ROLLING RING METAL TURNINGS CRUSHER

Designed for the plant with a smaller volume of metal turnings. If your plant produces 20 to 200 tons of metal turnings monthly, the American 1800 Crusher will bring you additional profit on the sale of crushed turnings plus savings in cutting oil, man-hours, plant space, and tool maintenance.

3 IMPORTANT WAYS AN AMERICAN 1800 CRUSHER BRINGS NEW PROFITS!

- **SHOVELLING TURNINGS BRING $3 TO $4 MORE PER TON!** A daily crushing capacity of only 2 tons will produce an additional profit which will pay for the equipment in less than a year and give you a handsome profit thereafter.
- **30 TO 50 GALLONS PER TON IN RECOVERED CUTTING OIL!** American-crushed turnings release oil more freely, are easier to handle in chip wringer, and prolong tool life through more liberal use of reclaimed oil. **Savings in cutting oil alone can pay for an American Crusher.**
- **UP TO 75% LESS STORAGE SPACE NEEDED — EASIER HANDLING!** Valuable savings in factory space; chips load heavier, easier in freight cars — substantially cut shipping costs.

OTHER AMERICAN CRUSHERS WITH CAPACITIES UP TO 30 TONS PER HOUR

Write today for free literature on Model 1800 Crusher or for more information about the American Crusher best-suited to your needs!

American PULVERIZER COMPANY

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

1539 MACKLIND AVE. ST. LOUIS 10, MISSOURI

turned to any position without the operator leaving his station.

For more information, *write* Ty-Sa-Man Machine Co., 1103 Hoyt Ave., Knoxville, Tenn.

Electric Lift Truck Easy to Maintain

ALL hydraulic and electric control mechanisms for the Scot electric lift truck are mounted on the underside of the top cover to afford immediate access. Result: An arm length, eye-level maintenance center.

The truck has a turning radius of 52 in. Other features include 20 per cent gradeability, exceptional speed in both travel and lift, positive traction with or without load, unitized balanced construction.

The truck is built in two models, the M-4 for 4000 lb capacity, and the M-3 for 3000 lb. Many safety features, such as the deadman pedal and programing speed control, are built into the unit.

For more information, *write* James Campbell Smith Inc., 4057 Erie St., Willoughby, Ohio.

Industrial AC Motors

INTEGRAL horsepower, alternating current motors (the Duty Master line) are available in sizes from 1 through 250 hp in protected

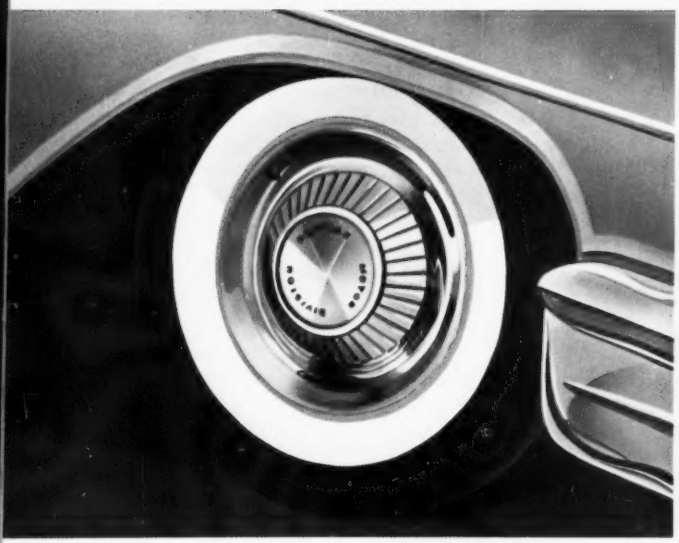
On cars of TOP PRESTIGE and HIGHEST VOLUME

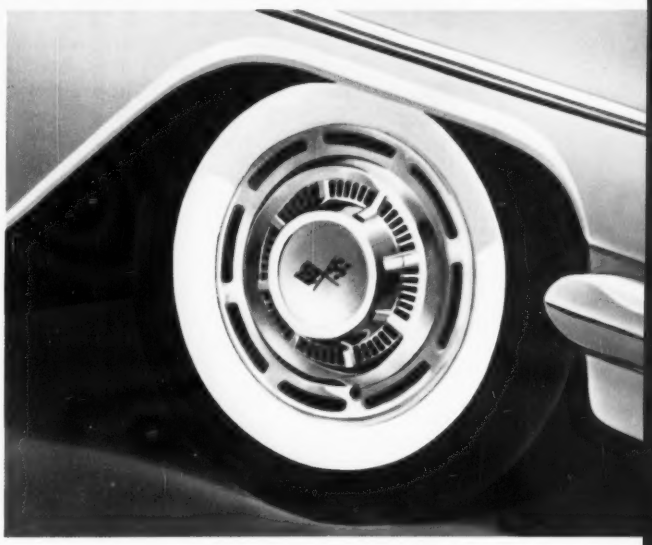
you'll find **wheel covers** of

Superior

STAINLESS STEEL

Leadership demands the best in performance . . . and only stainless steel will do for the gleaming wheel covers of leading cars. We are most proud that SUPERIOR Stainless Strip Steel is used in the fabrication of wheel covers by Brown-Lipe-Chapin. Every stainless quality is in our product, plus the finer forming behavior that is traditionally Superior. Let us discuss your stainless strip requirements.





SUPERIOR STEEL DIVISION

OF

COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

The wheel covers illustrated were fabricated by Brown-Lipe-Chapin Division, General Motors Corporation, Syracuse, New York.

IT PAYS TO STANDARDIZE ON **STANSCREW**

Stanscrew provides faster service, adds safety for BRUNNER SINCE 1906 compressors

The fasteners this man is tightening must be really dependable. Dunham-Bush, therefore, maximizes the safety margin for its Brunner line by standardizing on Stanscrew heat-treated cap screws for all critical applications.

With tremendous production demands on its Hartford plant due to industry's preference for Brunner compressors, Dunham-Bush also demands a supplier who provides quick assistance on all occasions, and moves especially fast in emergencies. Stanscrew meets these requirements because complete stocks are maintained at three conveniently located plants . . . plus a management philosophy which looks on shipments within 24 hours as normal procedure, subject to drastic improvement in emergencies.

Fast delivery and reliable products are but two of many reasons more and more industrial leaders are switching to Stanscrew. A complete selection of over 5,000 different standard fasteners . . . experienced fastener specialists to provide qualified technical assistance . . . these and many other factors underline the advantages of specifying Stanscrew for your fastener requirements.

Why not call your Stanscrew distributor today. He will gladly arrange a prompt visit from the Stanscrew specialist who can often save you money . . . for example, by substituting a standard fastener for a costly special.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

(open), weatherproof, totally enclosed, corrosionproof, and explosionproof enclosures.

They may be specified in all standard speeds and voltages. Designs include polyphase, ball bearing, vertical, and horizontal mounting arrangements with feet or footless, with NEMA C-face, D-flange, or P-base brackets.

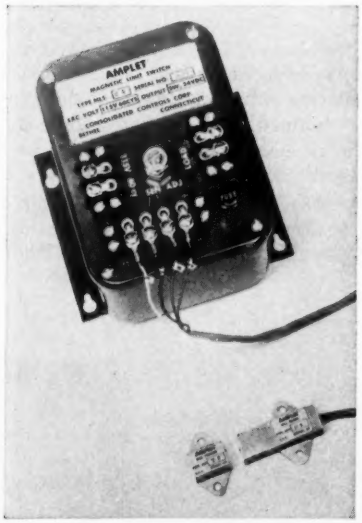
For more information, *write* Product Information Dept., Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

Magnetic Limit Switch Gives Precise Control

USERS and manufacturers of automatic equipment can employ the Amplet magnetic limit switch to gain precise control of the relative motion between two parts of a machine.

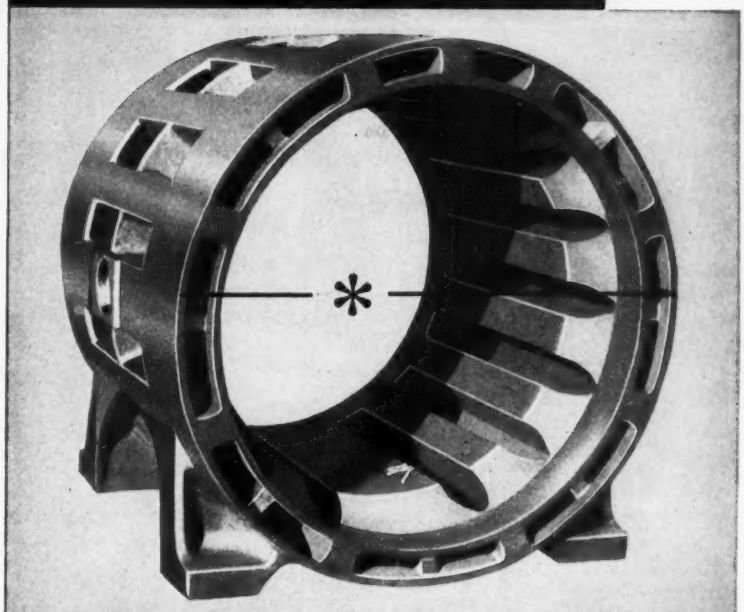
Typical applications include limiting cuts or traverse on shapers, planers, and drill presses; stopping conveyors at predetermined positions; continuous sequencing and counting; and automatic weighing and filling.

The device consists of three parts: A probe which is normally mounted on a stationary part of the machine, a magnetic trigger which is mounted on a moving part of the ma-



(*Please turn to Page* 216)

URICK'S DUCTILE IRON



Courtesy RELIANCE ELECTRIC & ENGINEERING CO., Cleveland, O.

MOTORS . . . . from the Lakes to the Sea

This 1300-pound URICK casting (a fan cooled motor stator frame made to Navy specifications) will withstand extra stress and strain and has better corrosion resistance because it is Ductile Iron. URICK recommends and successfully casts Ductile whenever greater tensile strength and higher impact value are of prime consideration because it has most of the advantages of steel, yet because of its high molten fluidity, it will take intricate shapes not possible with other high strength metals. Other advantages are—Ductile castability permits weight reduction while maintaining required physical properties . . . superior machinability reduces machining time and consequently results in longer tool life. There are other advantages and economies to Ductile when recommended, engineered, and cast by URICK, ask about them.

**This fan cooled motor stator frame to US NAVY specifications is cast in 16 different sizes from 16" to 42".*

Send for Bulletin on URICK's Ductile . . . ask for catalog on URITE gray iron and URICK's facilities, too! Remember, URICK starts with 'U.'

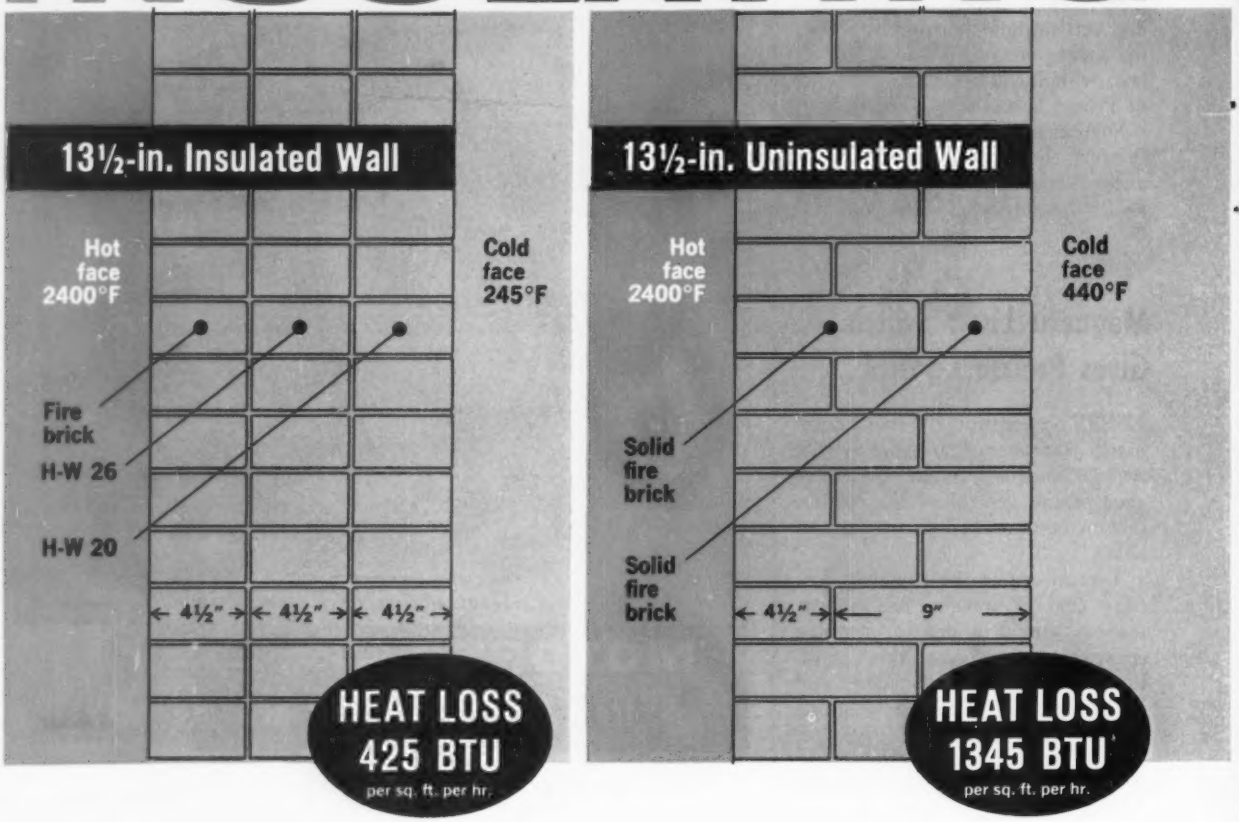
URITE CASTINGS URICK FOUNDRY

ERIE, PENNSYLVANIA

LICENSED UNDER PATENTS OF THE INTERNATIONAL NICKEL COMPANY., INC.

Stop heat losses with

INSULATING



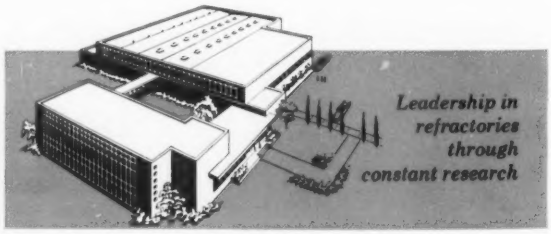
These furnace sections show how heat losses are reduced by using Harbison-Walker Insulating Brick for backing fire brick furnace walls. The heat loss is reduced 68.4%. These are typical of savings that are frequently experienced.

In addition to savings in fuel, floor space and weight, the use of insulating brick provides for faster heating and in some instances reduction of noise.

To assure best overall results, it is important that insulating refractories be carefully selected to secure the most advantageous combination of properties. Harbison-Walker having the full complement of both insulating and refractory brick, can furnish the correct combination for any requirement.

Harbison-Walker insulating brick have the balanced properties that mean dependable service. Light weight, essential to high insulating value and low heat-storage capacity, have been obtained to the greatest degree, consistent with the mechanical strength necessary for handling and for durability in service.

Technical service based on the most extensive experience and research is freely offered for assistance in determining the refractories best suited for each specific requirement.



The Garber Research Center

Harbison-Walker

FIRE BRICK

From these seven distinct types, choose the ones that will be best for your furnaces

VEGALITE
Unique silica insulating brick.
For service up to 3000°F.

H-W 30
Maximum service
temperature 3000°F.

H-W 28
Maximum service
temperature 2800°F.

H-W 26
Maximum service
temperature 2600°F.

H-W 23
Maximum service
temperature 2300°F.

H-W 20
Maximum service
temperature 2000°F.

H-W 16
Maximum service
temperature 1600°F.

H-W insulating products include all the other types and classes which provide for every specific requirement.

1. LOTHERM having extra mechanical strength is particularly adapted for use in rotary kilns and for insulating glass tank flux blocks.

2. H-W LIGHTWEIGHT CASTABLES comprise five distinct kinds for the fulfillment of the diversified applications of monolithic constructions.

3. H-W BLOCK INSULATION and H-W MINERAL FIBER COATING are widely used with highly efficient added insulation for backing fire brick and monolithic structures.

INSULATING REFRACTORIES AFFORD FOUR-WAY SAVINGS

1. Savings in fuel

The use of Harbison-Walker insulating fire brick greatly reduces heat losses and the amount of heat stored in the brickwork during operation, which causes loss of heat when the furnace is shut down.

2. Savings in time

With Harbison-Walker insulation the time required to bring the furnace to operating temperature is materially reduced. This is a distinct advantage when furnaces are operated intermittently.

3. Savings in space

Insulated furnaces may be built closer to each other without affecting the comfort of the workmen. This not only permits more efficient handling but also reduces capital expenditures for floor space.

4. Savings in weight

The reduction in weight of the furnace refractory structure often permits the use of a lighter foundation and lighter steel members in the form of buckstays, tie rods and other furnace bindings; also lighter door frames, doors and counter balance mechanisms.

HARBISON-WALKER REFRACTORIES CO.
AND SUBSIDIARIES
GENERAL OFFICES: PITTSBURGH 22, PA.
World's Most Complete Refractories Service

HARPER®

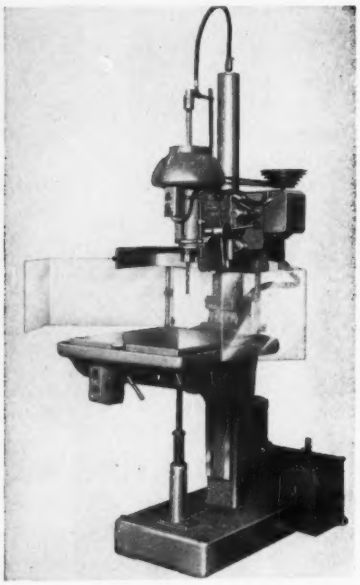
Extruding Corrosion-Resistant Metals at the H.M. Harper Co. Metals Division

chine, and a power amplifier which increases the power output of the probe to useful levels.

For more information *write* Consolidated Controls Corp., Bethel, Conn.

Hollow Spindle Drill Unit Uses Pressure Cooling

YOU CAN speed up tough drilling operations with this machine. It has a hollow spindle cooling system with a pump capacity up to 100 psi. Special splash guards are used.



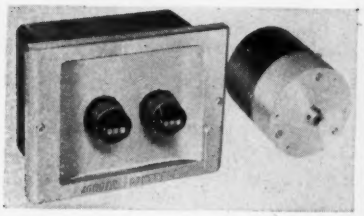
High pump pressure is not necessary when drilling materials such as glass or ceramics. City water piped to the spindle will do the job.

For more information, *write* Buffalo Forge Co., 158 Mortimer St., Buffalo, N. Y.

Electronic Limit Switch Can Be Reset Quickly

THE JORDAN electric limit switch senses and remotely limits position, weight, level, or pressure.

It is designed for applications where one or more trip points must



be frequently reset as in sequencing and programing. Limits are set quickly to accuracies of 0.2 per cent of full scale for standard units or to 1 part in 250,000 for special high accuracy systems.

It is used for setting machine tool limits, for setting trip points on batch weighing scales or load cells, for adjusting pressure limiting devices, and for a variety of other position or load limiting functions.

For more information, *write* Jordan Co. Inc., 3235 W. Hampton Ave., Milwaukee 9, Wis.

Industrial Rectifier Lines

TWO lines of 250 volt silicon rectifiers, one for heavy duty steel mill and industrial applications, and the other for general purpose operations, have become available.

The heavy duty units are made in 400, 500, 600, 750, 1000, 1500, and 2000 kw ratings with standard sizes carrying 100 per cent continuous loads, 125 per cent current loads for 2 hours, or 200 per cent for 1 minute.

The 150 to 300 kw general purpose rectifiers are for crane, hoist, and general shop service, elevator supply, machine tools, magnetic chucks, and lifting magnets.

For more information, *write* Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Recessing Tools Have Interchangeable Parts

INCREASED work range is possible with a line of automatic feed recessing tools because they have interchangeable parts.

Designed for use on standard drill presses, radial drills, and special machines, the units eliminate the need for complex special tooling in performing intricate machining operations such as relieving, grooving, chamfering, backfacing,

HARPER

Corrosion-resistance starts here

What CORROSION-RESISTANT Fastenings Do You Need?

Harper has manufactured fastenings in more than 100 different corrosion-resistant alloys . . . Stainless Steels, Monel, Silicon Bronze, Naval Bronze, Brass, Aluminum, Titanium.

What STANDARD Type and Size Do You Need?

From #2 screw size through diameters of 2 inches, Harper maintains the broadest standard product line in its industry . . . and Harper Distributors are everywhere. See your Yellow Pages.

What SPECIAL Type Fastenings Do You Need?

Cold Heading and Hot Heading techniques are a science at Harper. Both "know-how" and facilities are directed toward cost-reduction and quality improvement on your parts of non-standard size and shape.

What EXTRA Benefits Does Harper Give YOU?

- You have assured supply because Harper produces its own raw metal.
- You receive immediate deliveries from local stocks.
- You gain customer goodwill for your products through Harper quality.
- You lower your costs by efficiencies in purchasing, maintenance and assembly.

Attach to your letterhead

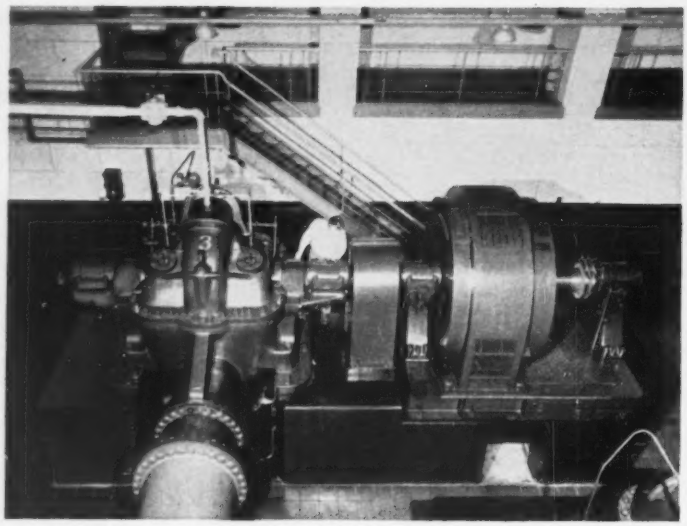
FOR COMPLETE REPORT

Sales Material Department
THE H. M. HARPER COMPANY
8200 Lehigh Avenue
Morton Grove, Illinois

Gentlemen: Send me a copy of the new Harper "Corrosion Guide" at no cost or obligation.

THE H. M. HARPER COMPANY
8200 LEHIGH AVENUE • MORTON GROVE, ILLINOIS

A case for F-M Split-Case Centrifugals!



Typical installation in Toledo averages 80.314% wire-to-water efficiency for year!

Exceptionally high and dependable efficiency with steady, low-cost operation year after year—that's the report from a host of municipalities and industries using Fairbanks-Morse pumps in their pumping stations.

Why? Ask stations like Collins Park High Service in Toledo, O., where five Fairbanks-Morse 36-in. Split-Case Centrifugal Pumps have been giving superb performance for 17 years. The No. 3 pump in the photo pumped 6,065,590,000 gallons in one year alone, handling 26.13 percent of the plant total, and consuming just 3.55 kilowatts hours per million foot gallons!

Your Fairbanks-Morse Field Engineer welcomes you to inspect many other reports like this from his files—reports revealing why no other manufacturer can match the experience of Fairbanks-Morse in providing pumps and drivers for both municipality and industry. Your F-M Field Engineer will be glad to work with your own engineers in selecting the best equipment for your specific requirements. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

See Sweet's Product Design Catalog File for complete F-M Pump Line.

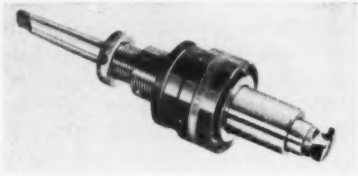
FAIRBANKS-MORSE

a name worth remembering when you want the BEST

PUMPS • SCALES • ELECTRIC MOTORS • DIESEL, DUAL FUEL AND GAS ENGINES
LOCOMOTIVES • COMPRESSORS • GENERATORS • MAGNETOS • HOME WATER SYSTEMS

counterboring, necking, and boring. Two basic types and seven standard sizes cover workhole diameters from 1/4 to 4 1/2 in. and up to 0.300 in. depth of cut.

Interchangeable parts include stop collars and pilot nose assemblies for piloting in fixture bushings or in the work. Tools are available with concentric or eccentric tool mounting. Feed is automatic and continuous. It begins when the stop collar contacts the work (or fixture bushings), is actuated by a simple lead cam mechanism in the tool body.

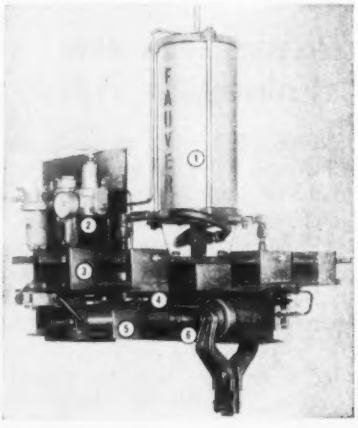


For more information, *write* Scully-Jones & Co., 1901 S. Rockwell St., Chicago 8, Ill.

Conveyor Lubricator Has Universal Head

THE UNIVERSAL head of the Fauver automatic conveyor lubricator allows it to pick up trolleys of various makes on the same conveyor. It handles either oil or grease.

The lubricator is a self-contained unit which is mounted on the trolley rail and actuated by the moving conveyor. As the wheel approaches the lubricator, it engages a nozzle of the pumping unit which is then auto-



Reducing Billets to Wire Rods in Continental's Continuous Rod Mill. From an original scratchboard drawing by James R. Neebe.

"Speedway" for Hot Rods

From billets to rods—three strands at a time travel through Continental's modern new Continuous Rod Mill. In the complete rolling process a 2½" round cornered square billet 30 feet long may be reduced to a .218 inch diameter round wire rod approximately 4,700 feet long. The glowing strands can be seen as they progress through 22 roll stands. At the final pass the rod is moving at a speed of about 5,000 feet per minute.

It's all a part of the important job of making wire for home, farm and industry . . . wire for more than a thousand applications. For from the shoes on your feet to the mechanical pencil in your pocket, from coat hangers to automobile control rods, wire plays an important part of our daily life.

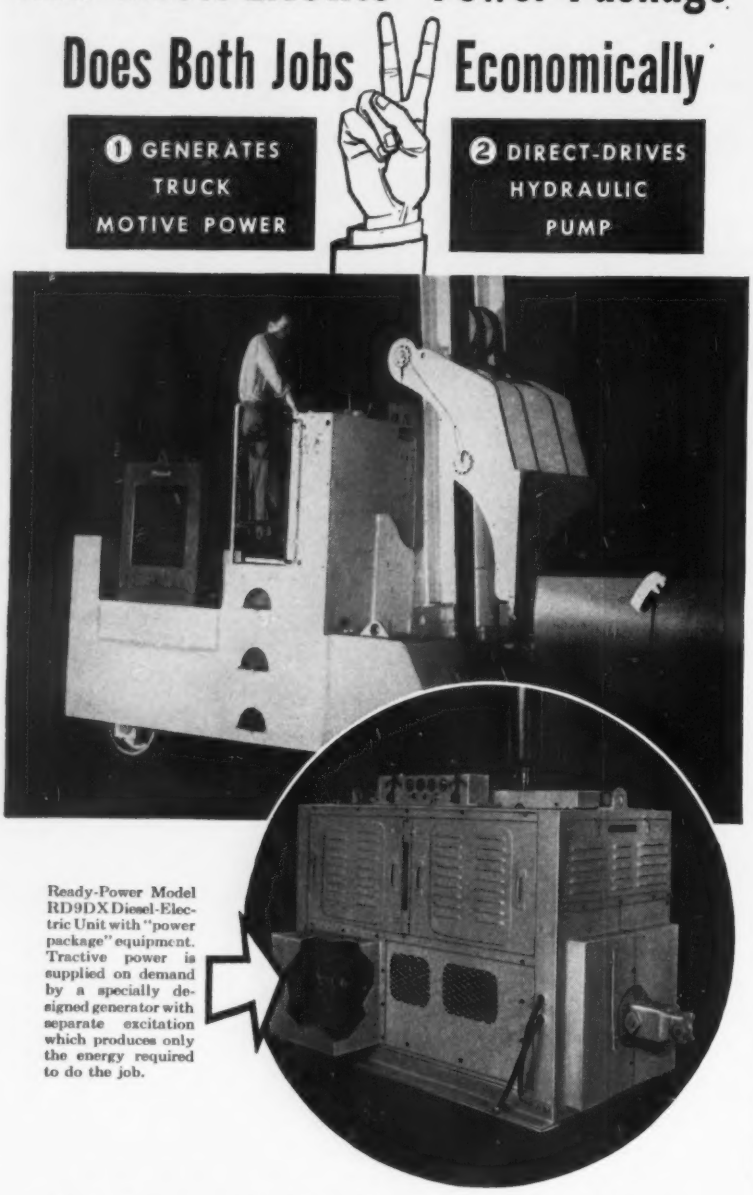
Here at Continental's Rod Mill, steel rods are produced around the clock and sent to the wire mill for drawing, processing, and finishing into wire in a wide range of sizes and finishes. All Continental Wire is made from basic open hearth steel, in practically any size, temper, and analysis in low and medium low carbon steels. It will pay you to learn the whole story of Continental Wire—and how it can speed production and cut costs for you. Write for our new Manufacturers' Wire Manual today.

CONTINENTAL STEEL

CORPORATION • KOKOMO • INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, Kokote, Brytite, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Concrete Reinforcing Fabric, Continental Chain Link Fence and other products.

New Diesel-Electric "Power-Package" Does Both Jobs Economically



Ready-Power Model RD9DX Diesel-Electric Unit with "power package" equipment. Tractive power is supplied on demand by a specially designed generator with separate excitation which produces only the energy required to do the job.

Ready-Power makes diesel-electric power doubly effective with a newly developed "power package" designed specifically for use with its "RD" Series Power Units. This remarkable new concept allows the unit to operate at *constant speed*, no load to full load, yet supplies full range of tractive power on demand and produces continuous hydraulic power without need for intermediate electric motors. The last word in simplicity, this new "power package" eliminates contactor failure, minimizes maintenance, assures maximum operating economy for electric trucks up to 200,000 lb. capacities. Write for complete information.

READY-POWER

The READY-POWER Co., 3824 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

matically brought in contact with the grease fitting. The wheel carries the nozzle with it and when the nozzle is pointing straight at the trolley, a measured amount of lubricant is discharged under pressure into the wheel bearings.

For more information, *write* J. N. Fauver Co. Inc., 51 W. Hancock, Detroit 1, Mich.

Roll Finishing Machine Handles Small Parts

SCREWS, washers, delicate gears, precision instrument components, and similar parts can be precision finished in the Techline roll finishing machine.

The machine uses octagonal shaped barrels. They are set on rollers powered by a ½ hp drive. Barrels are made of durable neoprene which resists oil, greases, and most chemical solutions.

On the larger models, up to eight barrels can be run simultaneously. However, regardless of the number of barrels in operation, each can be removed or placed on the rollers with minimum effort for loading or unloading without shutting off the machine.

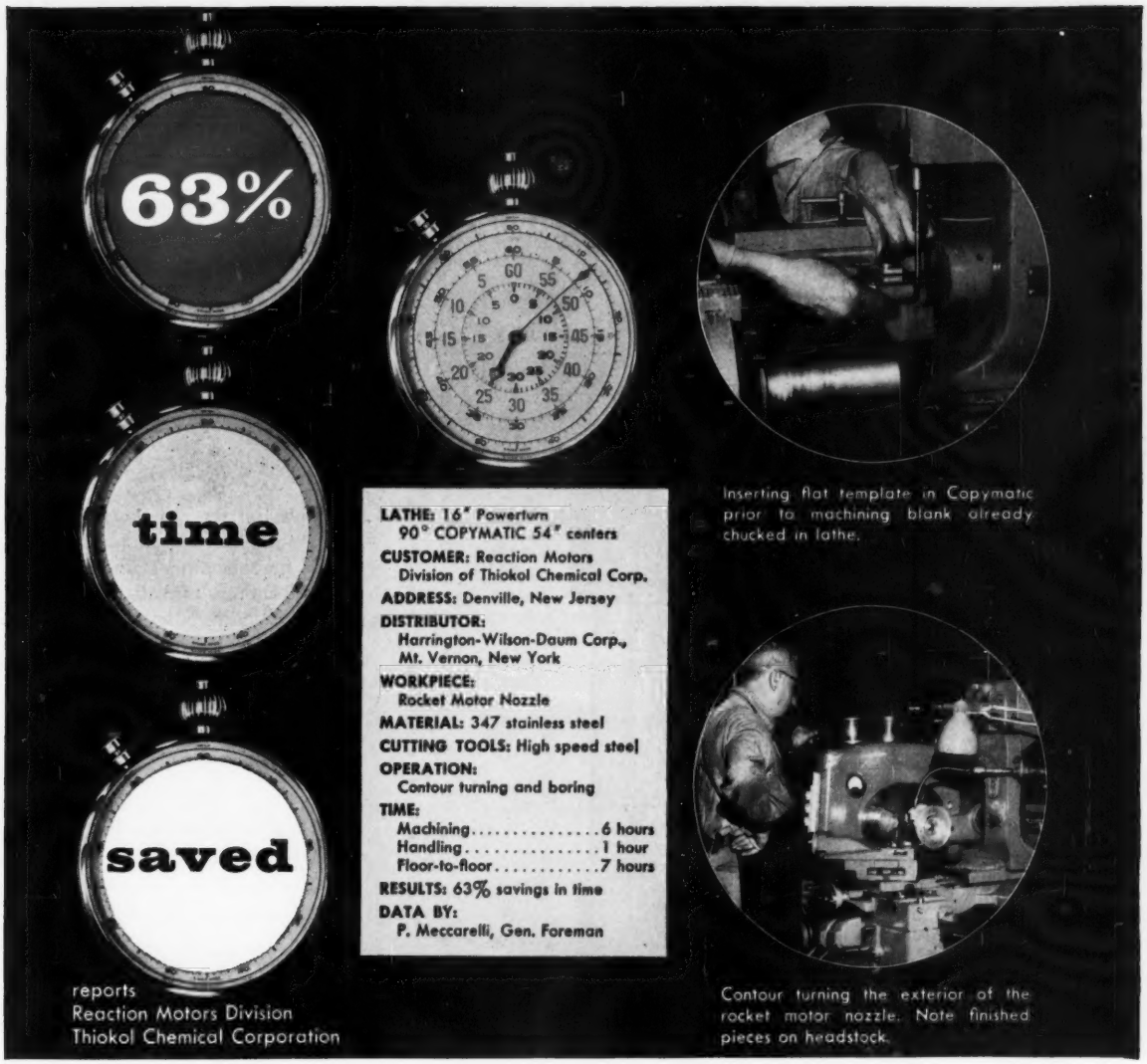
For more information, *write* Techline Div., Wheelabrator Corp., 1157 Avenue V, Vicksburg, Mich.

Metal Cutting Bandsaw Has Large Capacity

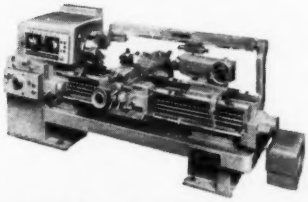
HERE is a horizontal metal cutting bandsaw developed for cutting a variety of materials where large capacity is needed with restricted length of cut.

The machine has a capacity of 60 x 60 in. and a maximum length of cut of 18 in. The frame columns are large box sections with replaceable guide rails. The cutting head is raised by two hydraulic cylinders, one at each side of the frame. That feature minimizes vibration and assures correct alignment.

Variable speed drive, infinitely adjustable from 60 to 300 fpm, provides the operator the exact speed



by this Lodge & Shipley Powerturn Copymatic Lathe



A pioneer in jet propulsion, Reaction Motors Division of Thiokol Chemical Corp., Denville, N. J., plays an important part in America's rocket defense and space exploration programs. In turn, and in turning, a Lodge & Shipley POWERTURN COPYMATIC plays an important part in rocket motor production.

In contour turning and boring a typical reaction motor nozzle, the COPYMATIC cuts 12 hours from the previous time, completing the job in 6 hours machine time and one hour handling time.

Whether you're machining the new and tougher alloys or the old stand-by metals, you'll appreciate the strength, rigidity and extra power available in Lodge & Shipley Lathes. For special jobs or routine operations, the speed and accuracy of these world famous lathes offers much to virtually any lathe user.

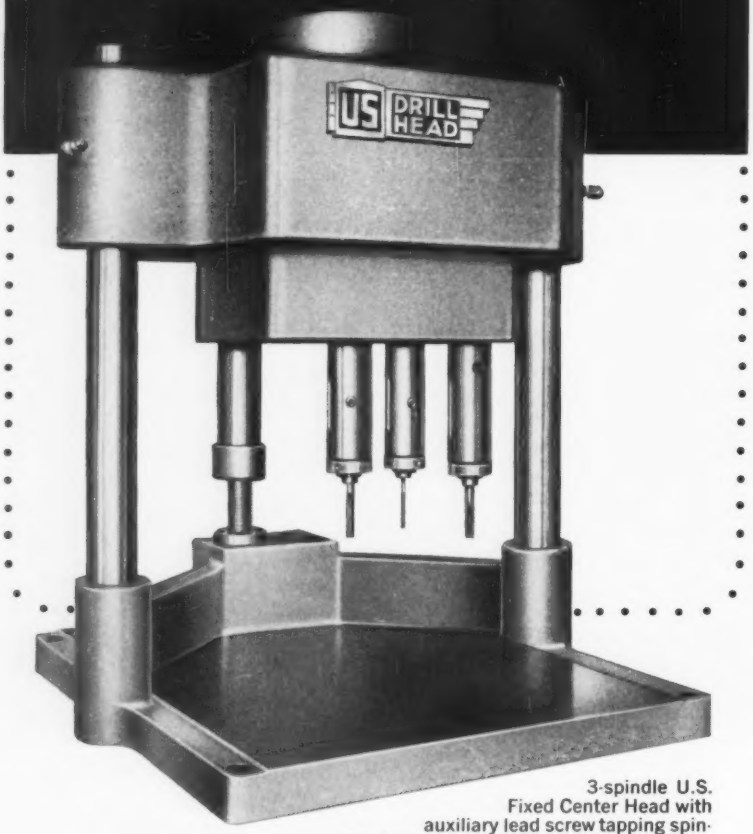
Investigate the time and money-saving possibilities of Lodge & Shipley COPYMATIC Lathes with 45° or 90° tracer slides. Contact your Lodge & Shipley representative or write for literature:
The Lodge & Shipley Company, 3070 Colerain Ave., Cincinnati 25, Ohio

More than ever before, your LODGE-ical choice . . . **Lodge & Shipley**

Get low-cost

MULTIPLE-HOLE LEAD SCREW TAPPING ON A DRILL PRESS

with U. S. Heads



3-spindle U.S. Fixed Center Head with auxiliary lead screw tapping spindle for precision tapping three hole sizes.

Whether on high or low production runs, you can do precision tapping of multiple-hole patterns on a drill press *at low cost* with a U. S. Master Lead Screw Head. These special fixed center heads are built with varying number of spindles and tap sizes in any one head—with exact gear ratio required to each spindle as well as to master lead screw. Use on any drill press having a reversing spindle.

The cost-reducing production of precision multiple-hole patterns is OUR BUSINESS! Ask our engineers to talk with yours.

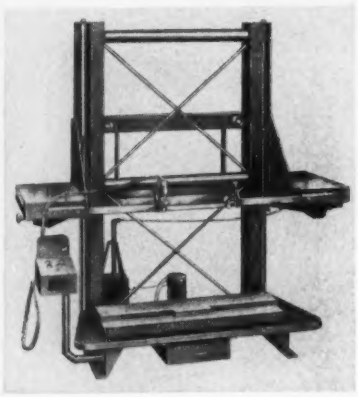
US DRILL HEAD

Adjustable and Fixed Center Multiple Drilling Heads.
Individual Lead Screw Multiple Tapping Heads.

UNITED STATES DRILL HEAD CO.

BURNS STREET • CINCINNATI 4, OHIO

NEW PRODUCTS and equipment



for all materials. The operator dials the desired speed in complete safety while the machine is in operation.

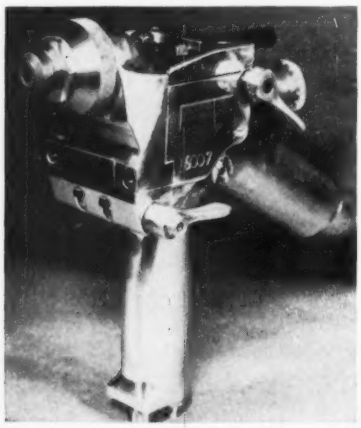
For more information, *write* W. F. Wells & Sons, Three Rivers, Mich.

Metallizing Gun Adjusts Air Cap Automatically

FAST, fine grain spraying of all metals (from molybdenum to lead) is possible with the SpraRod metallizing gun. It has a two position air cap that adjusts itself automatically.

The gun will operate on all combustible gases using the same nozzle and siphon mixing and metering system. The two piece gas head with a cam operated diaphragm type gas valve is designed to avoid cross leaks and the use of sealing lubricants.

The wire feed range of 1.32 to 23.1 fpm is accomplished by a dual range air motor system. The air motor and reduction gear head can



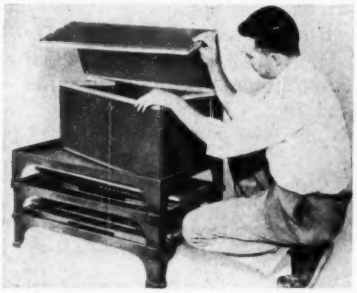
be removed in seconds. The speed is regulated by a mechanical variator that permits high torque at low wire speeds.

For more information, *write* SpraRod Corp., 2795 E. 83rd St., Cleveland 4, Ohio.

Box for Material Handling Collapses to Save Space

MANY kinds of materials can be transported or stored in the Kennett one piece, collapsible box.

It is a large capacity container, easily handled by fork lift, that can be collapsed into only 6 in. of its original height for returning or storage. Piano type hinges connect the box's solid side panels, split end panels, and base.



A special stacking foot permits fork lifts to handle the new boxes, singly or stacked, from all four sides.

The stacking foot also simplifies storage of collapsed boxes.

For more information, *write* National Vulcanized Fibre Co., 1059 Beech St., Wilmington, Del.

Measuring Instrument Checks Contours Quickly

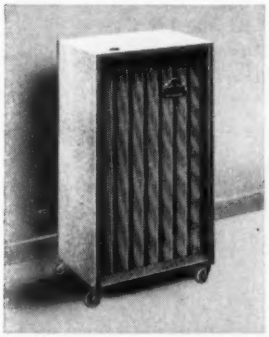
ECONOMICAL checking of contour parts up to 30 in. in diameter and 10 in. in width can be handled by the Model SP-2 Contour-O-Scope.

The unit can be operated by anyone who can use a micrometer. The piece to be checked is mounted accurately on a precision rotary table and is measured by a universal probe which can handle 98 per cent of parts requiring checking. The probe is brought into contact with the surface to be checked by precision ball bearing movements, each

New Vinyl-Metal Laminate steps up styling and sales for 4 famous products

PHILCO tested many casing materials for its portable Seventeener TV. Only Colovin laminate could provide the twin advantages of realistic cost plus the luggage smartness of alligator finish.

THUNDERBIRD interior presents uninterrupted flow of leather-grained Colovin vinyl which matches upholstery and painted surfaces. Laminated parts are machined on standard equipment.



EBCO Oasis dehumidifier is high-styled with tweed-finish Colovin vinyl bonded to 22 gauge steel. Case is pierced, notched, drawn, formed and folded on same equipment used for metal alone.

ROBERTS-GORDON "trademarks" its conversion burner with a custom reproduction of Gordon plaid in Colovin vinyl laminate at a cost "but pennies more than painted components."

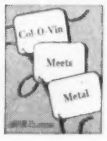
Send for "Colovin Meets Metal"

Contains laminate samples, multi-color printing, embossed effects, textures, test specifications, industrial applications, and a list of laminators to whom we supply Colovin vinyl sheeting. Send for copy.

COLOVIN®

first and finest in vinyl laminates

COLUMBUS COATED FABRICS CORP., Dept. ST-959, Columbus 16, Ohio



Please send me your brochure, "Colovin Meets Metal."

Name _____ Title _____

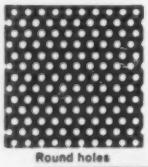
Company _____

Address _____

City _____ Zone _____ State _____

LET H&K PERFORATED MATERIALS

put personality into your products

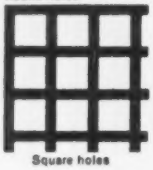


Round holes

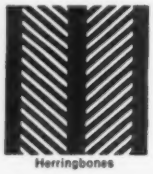
Whenever—wherever—your products require perforated materials, you will find the pattern and open area "just right" for that custom-look in the vast selection of H & K existing dies.

Modern facilities and H & K experienced craftsmanship, enable the perforating of practically all metals, wood, compositions and plastic. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

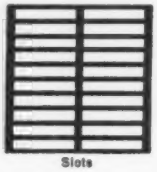
Illustrations shown in reduced size



Square holes



Herringbones



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Oblong holes

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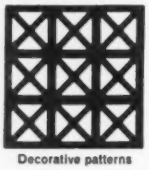

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The manufacturer states that dimensional accuracy of parts such as impellers, expellers, inducers, turbine wheels, and three-dimensional cams can be checked directly from the print or plotted dimensions without time consuming layouts or individual readings.

For more information, *write* TurboTronics Corp., 19360 Rosedand Ave., Cleveland 17, Ohio.

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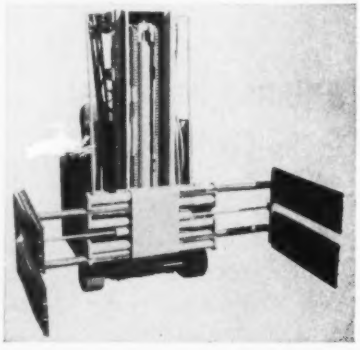
ALMOST any type nonpalletized load can be handled with this side shift load grab with multipurpose arms. You don't have to use a different truck or change arms when handling different types of loads. It can carry loads of drums, cartons, crates, bales, or rolls.



The arm gripping surface can be smooth or rough-top rubber bonded to steel sheets which are screwed to the plates.

For more information, *write* Dept. R9-10, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass.

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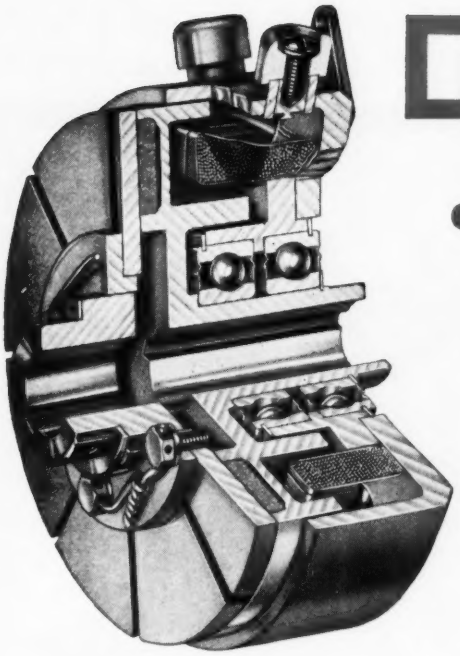
EATON DYNA-TORQ

MAGNETIC-FRICTION CLUTCHES and BRAKES



STATIONARY-FIELD, BEARING-MOUNTED DYNA-TORQ CLUTCH

Now Available in a Full Line from 1¾" to 15" Diameter

Eaton Dyna-torQ Magnetic-Friction Clutches and Brakes provide a simple, accurate, responsive method of controlling power and motion in today's complex production and processing machines.

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- ★ Dependable motion control
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- ★ Easy "built-in" installation
- ★ Low maintenance costs
- ★ Compact plug-in type controls—may be remotely mounted
- ★ Inter-changeability of parts

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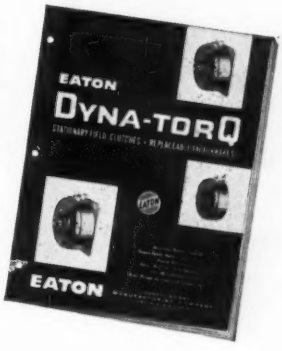

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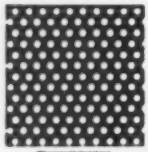

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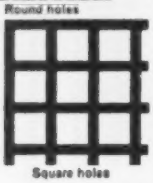
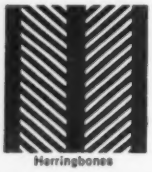
Illustrations shown in reduced size



Square holes



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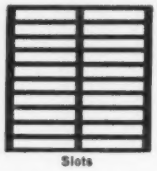

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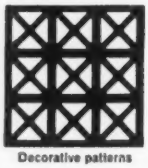

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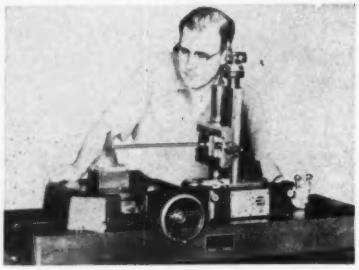

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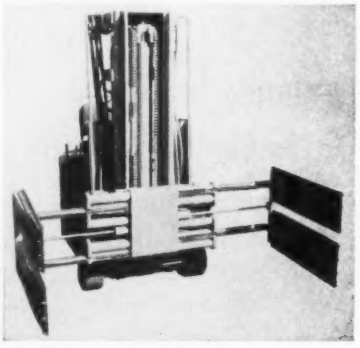

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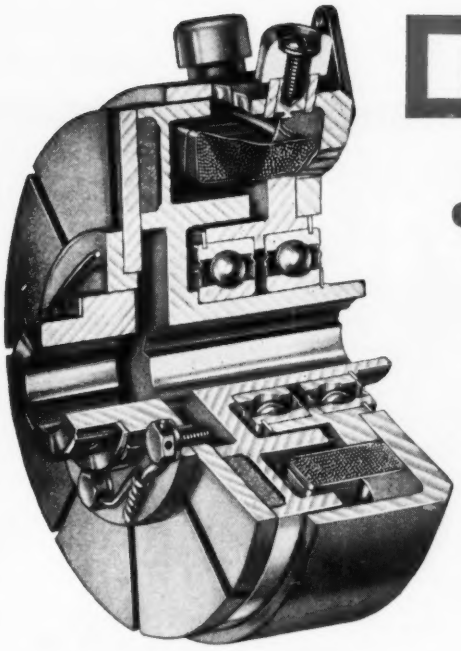

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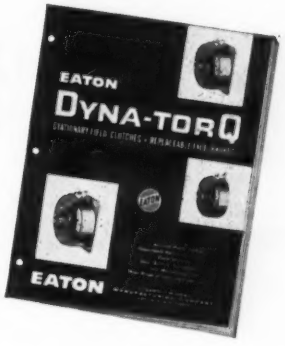

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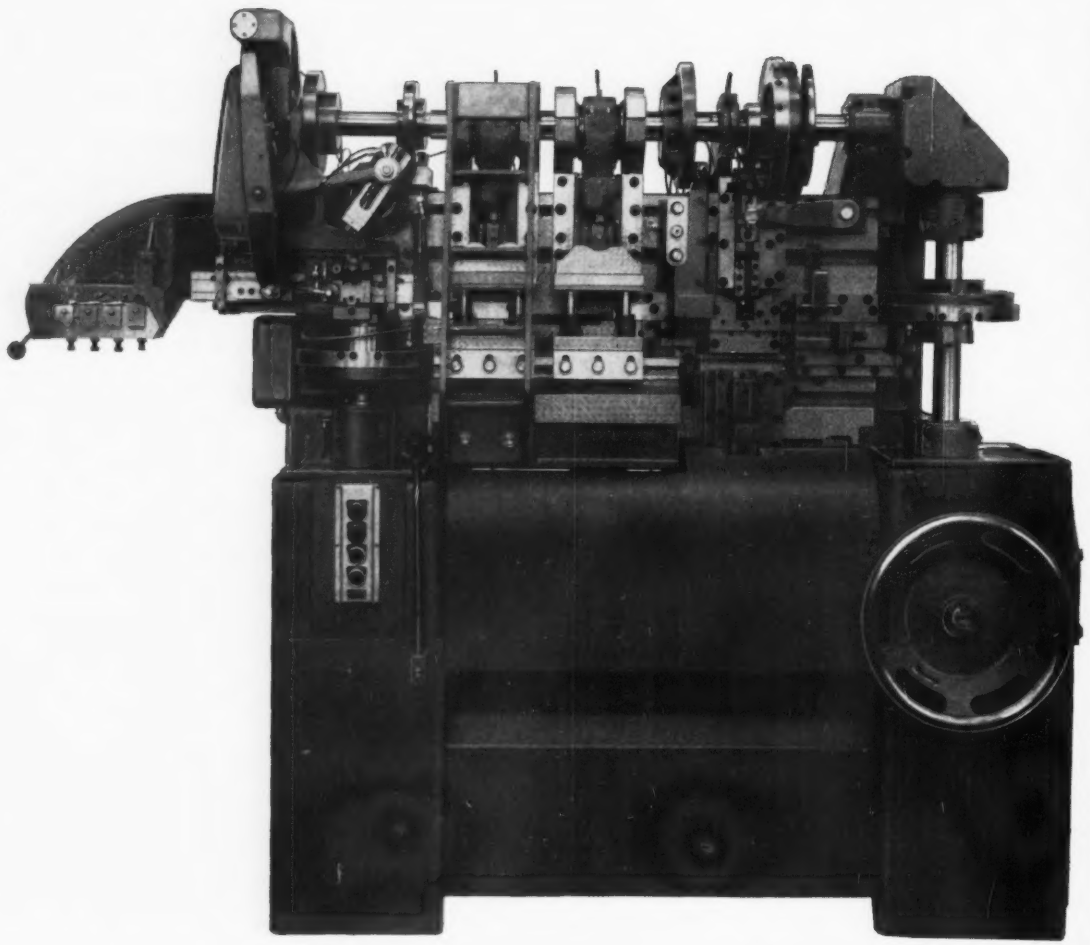

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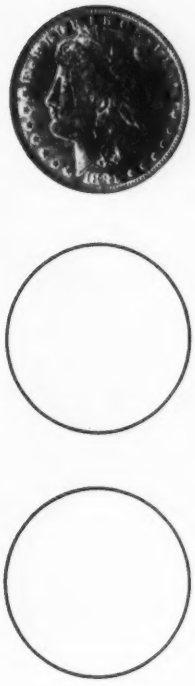

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Truck Operator Manual

The 20 page guide is intended for use by instructors handling industrial truck operators' training programs. Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.

Media Selection Chart

Booklet PUR-66D guides the selection of proper engineering materials and filter media for more than 125 types of corrosive conditions. Purolator Products Inc., Rahway, N. J.

Carbon Dioxide Welding

A 38 page booklet describes Hobart's metal, inert gas, shielded arc process (called Migarc) welding of mild steel and low alloy steels with carbon dioxide shielding gas. Hobart Bros. Co., EW-208, Troy, Ohio.

Stainless Bars and Wire

A 77 page book on cold drawn stainless steel describes the general qualities of 27 different types of ferritic, austenitic, ferritic-austenitic, and martensitic stainless steels. Uddeholm Co. of America, 155 E. 44th St., New York 17, N. Y.

Strip Coating Bulletin

Bulletin No. 500, describes strip coating of metals with a diagram of a complete strip coating line and data on each component in the line. J. O. Ross Engineering, 730 Third Ave., New York 17, N. Y.

Cold Extruded Metal Parts

The process of producing cold extruded metal parts, their physical characteristics, mechanical properties, economies, and applications are covered in a four page bulletin. Burgess-Norton Mfg. Co., Geneva, Ill.

Metal Cleaning Techniques

A 32 page handbook presents over 100 types of equipment and techniques for the cleaning and preparation of metal surfaces. Dept. S, Equipment Div., Magnus Chemical Co. Inc., Garwood, N. J.

Fire Protection in Building

A 44 page booklet discusses fire-resistant construction in modern steel-framed buildings. American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y.

Aluminum Bronze Bars

A folder outlines the advantages of solid and centrifugally cast cored bars which are available in standard 12½ in. lengths and in sizes up to 8 in. OD. Johnson Bronze Co., New Castle, Pa.

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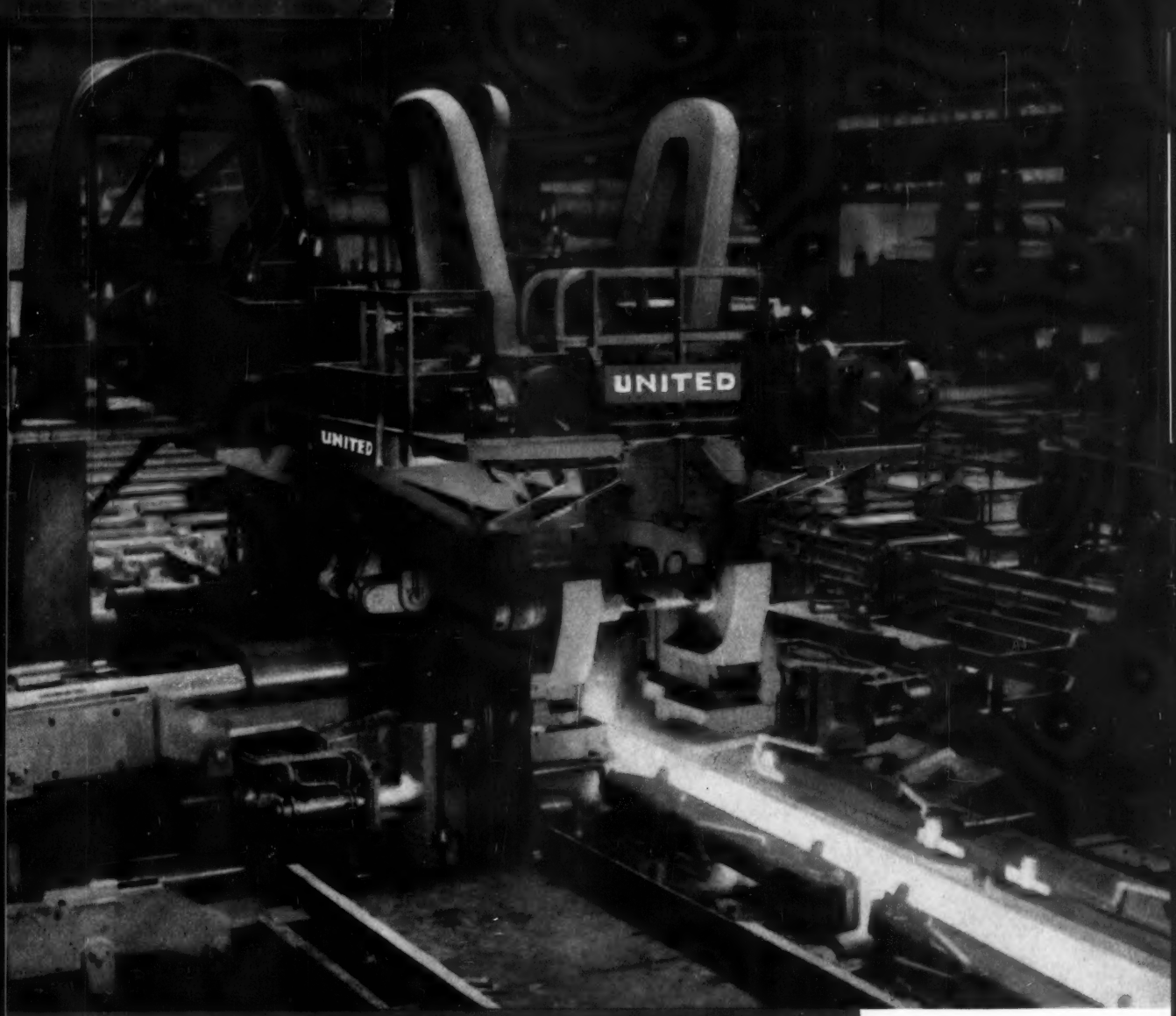

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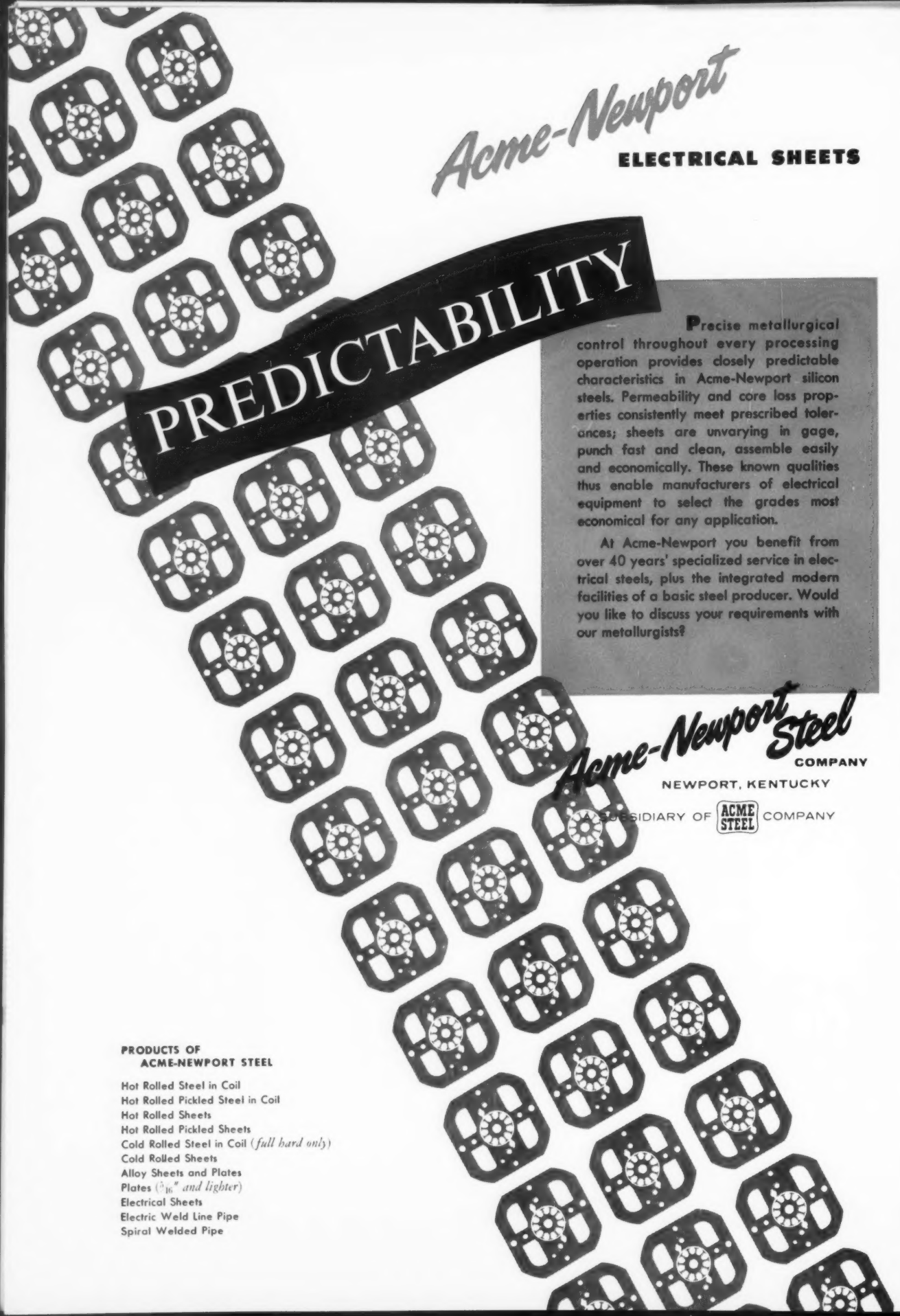

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PREDICTABILITY

Precise metallurgical control throughout every processing operation provides closely predictable characteristics in Acme-Newport silicon steels. Permeability and core loss properties consistently meet prescribed tolerances; sheets are unvarying in gage, punch fast and clean, assemble easily and economically. These known qualities thus enable manufacturers of electrical equipment to select the grades most economical for any application.

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Plates ($\frac{3}{16}$" *and lighter*)
Electrical Sheets
Electric Weld Line Pipe
Spiral Welded Pipe

September 14, 1959

Troubles Start Now for Small Users

SMALL CONSUMERS are feeling the pinch as the strike heads toward its tenth week. Unless there's a sudden settlement, thousands of hands will soon be reaching for panic buttons.

Inventories have fallen from an all time high of 26 million tons to a barely adequate 17 million. Although stocks are still about 3 million tons above the minimum working level, they're getting out of balance. Smaller companies are running into trouble because their financial resources and storage facilities weren't large enough to permit heavy stockpiling.

BIG BUYERS WELL FIXED—Because they had both the means and the foresight to invest in large inventories, major consumers have no immediate problems. Automakers say they can keep going through October (see Page 112). Chrysler Corp. is in the best position, General Motors Corp. in the worst. Ford Motor Co., with a steel plant of its own that can supply 50 per cent of company requirements, is in the middle.

Electrical equipment manufacturers have enough plates to sustain full production for the rest of the year, enough structurals to last until Dec. 1, enough bars until Nov. 1. Sheets will last until Oct. 15 or possibly until Nov. 1, depending on sizes. Some companies have been trying to fill out their inventories with steel from service centers. Distributors can't meet the demand for sheets 66 to 84 in. wide because they don't stock much material wider than 48 in.

FABRICATORS CHANGE TACTICS— Fabricators who were cutting each other's throats to get jobs a few months ago are helping each other out during the strike by trading steel items that are in short supply. Although inventories are still large from a gross tonnage standpoint, spot shortages are halting some jobs and forcing the redesign of others.

IMPORTS HIT PEAK— Imports of finished steel products set a new monthly record of an estimated 430,000 tons in July. Exports fell to 160,000 tons (from June's 191,355) and were exceeded by imports for the eighth consecutive month. Seven month totals for 1959 show that imports (2.34 million tons) are nearly double exports (1.2 million). What's more, they've already surpassed the largest tonnage ever brought into the U. S. in a full year (2.2 million tons in 1951).

LOST MARKETS FEARED—The strike may result in permanent loss of some domestic markets to foreign producers, warns Republic Steel Corp.'s chairman, Charles M. White. How important is the 2.34 million tons brought in during this year's first seven months? It's roughly equivalent to the finished steel capacity of Republic's Cleveland plant, which employs 9500.

CONVERSION CONSIDERED— Even though conversion steel costs substantially more than metal shipped directly from integrated mills, consumers are interested. Availability seems to be more important than price. When steelmaking resumes, the number of mills that can supply ingots or do conversion rolling will be limited by comparison with the Korean War period.

OUTPUT UNCHANGED—Last week, steelmaking operations continued at 12 per cent of capacity. Output was about 340,000 ingot tons.

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*Current prices were published in the Sept. 7 issue and will appear in subsequent issues.

PARTS BY THE THOUSANDS . . .

Left to right: Plastic tubing, rings and formed spacers, coupling blanks, heavy pipe nipple blanks, standard pipe nipple blanks.

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Superior Pipe Specialties Co., Chicago, reports a *ten year* profit success using Bardons & Oliver Cutting-Off Lathes.

The firm produces parts for their hydraulic equipment plus a wide variety of products on a jobbing basis.

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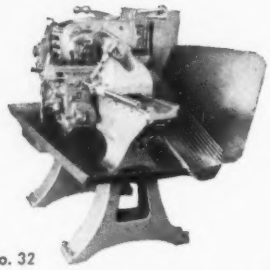
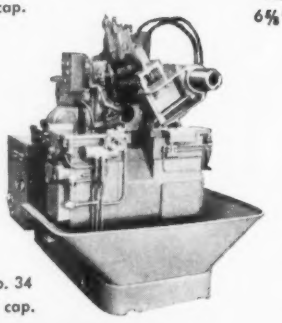
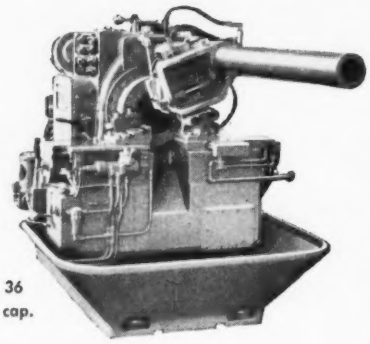
As the above photograph suggests, "versatility" is the name for these Bardons & Olivers. They're unexcelled for forming, chamfering and cutting-off tubular or solid bar stock. You realize extra profits by using these outstandingly rugged machines in your plant. Available in collet capacities from 2 to 16 inches, with automatic loading and unloading equipment if desired.
Bardons & Oliver, Inc., 1147 West 9th Street, Cleveland 13, Ohio.



No. 32
2" cap.



No. 34
4" cap.



No. 36
6⅝" cap.

OPERATING DATA FROM SUPERIOR

Typical hourly production
- No. 32 — 4000 - ½" pipe nipples chamfered & cut-off.
- No. 34 — 1082 - 2" pipe nipples chamfered & cut-off.
- No. 36 — 240 - 5" pipe nipples chamfered & cut-off.

Tolerances held on lengths: ±.002"

Average set-up time: 20 minutes

Tooling
High speed steel, carbide or roller cutter, depending on finish desired, material, operations performed and lot size.

Operators Required
2 men operate 3 machines, including setup, loading, and unloading (With automatic handling equipment 1 man can run 3 machines).

BARDONS & OLIVER

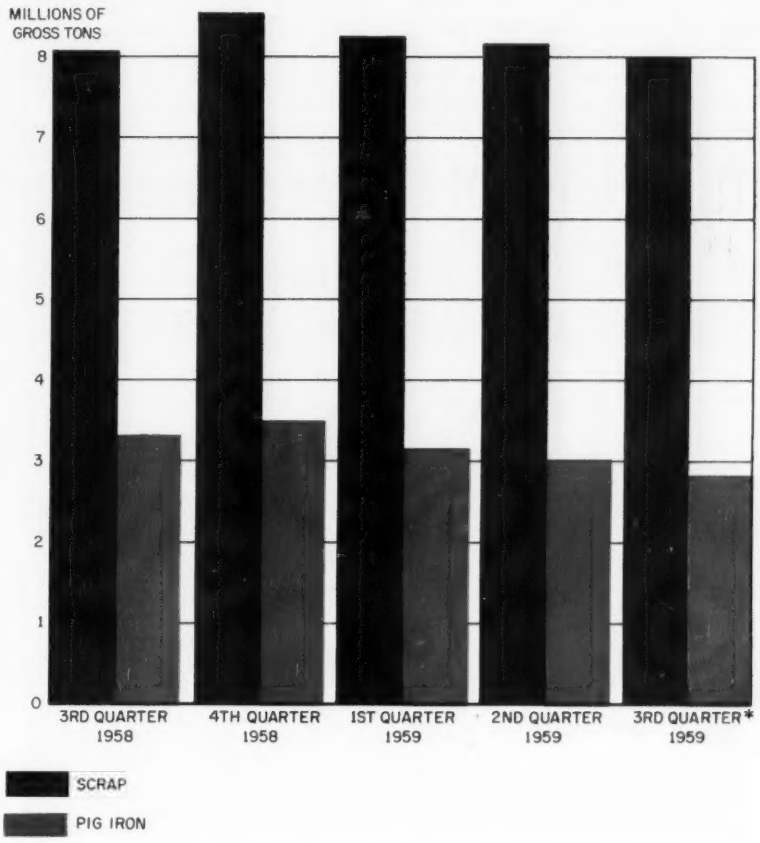
Manufacturers of Turret Lathes and Cutting-Off Lathes

Poststrike Scrap Mart to Be Steady

IT'S ALMOST two full months since start of the steel strike in mid-July which closed down about 85 per cent of the nation's primary steelmaking capacity. But despite virtual suspension of steel production, consumers' stocks of scrap and pig iron show little change, indicating impact of the strike has been less severe than had been anticipated.

At the end of third quarter (Sept. 30), it's estimated users will be holding about 8 million gross tons of scrap vs. 8.1 million at the close of the second quarter this year and about 8 million a year ago. Pig iron stocks at the end of the current quarter are expected to total around 2.9 million tons vs. 3 million at the end of the second quarter and 3.3 million when the third quarter closed last year (see chart).

Scrap and Pig Iron Stocks Held by Consumers at the End of Each Quarter



*Estimated.

• **Drop Slight Percentagewise** — Stated in percentages, the drop in users' scrap stocks from the second quarter to the third quarter this year was only about 2.5 points, and from a year ago around 5 points. The decline in pig iron was 5 per cent from the June quarter this year, and about 13 per cent compared with a year ago.

Extent to which scrap suppliers' (dealers') inventories rose during the strike can't be reliably estimated because factual data are lacking. However, it's thought they increased only moderately, a view supported by active bidding on the automotive lists at the end of August, bids that raised prices $1 to $2 a ton over those paid at the end of July.

• **Supplies Contained**—Scrap generation fell off some this summer because of curtailed manufacturing to permit mass vacations. Not much tonnage was added to dealers' stockpiles, as the yards continued to ship substantial volume to steel mills unaffected by the strike (15 per cent of capacity), and to the foundries.

Also, exports continued to provide a substantial outlet for dealer scrap over the summer. It's expected that two or three cargoes will be loaded at Philadelphia this month, while it's reported the Japanese have just purchased 1.3 million tons of U. S. scrap for October-March shipment.

• **Some Iron Production** — While most blast furnaces were idled, it's estimated unaffected producing capacity turned out somewhere around 200,000 tons of iron weekly throughout the period. A substantial part of that tonnage was on merchant account. It probably was sufficient to necessitate only a relatively minor drain on stocks.

Of course, inventories of scrap and

Scrap-Pig Iron Consumption

(Gross tons)

Months	Scrap	Pig Iron
July 1958	3,716,739	3,820,293
August	4,203,034	4,324,052
September	4,472,219	4,524,851
October	5,091,207	5,239,582
November	4,803,615	5,190,118
December	4,973,670	5,319,991
January 1959	5,375,042	5,609,509
February	5,657,873	5,627,953
March	6,677,499	6,798,053
April	6,652,916	8,275,777
May	6,642,572	6,867,857
June	6,324,000	6,591,000

pig iron held by the strikebound steelworks should be in about the same volume as they were when the walkout started.

• **See Stronger Market** — Looking ahead, a stronger scrap market in the poststrike period compared with that in the first half of the year is indicated. However, two factors suggest that prices won't advance as much as some observers have been predicting: 1. Fabricators are generating large quantities of industrial grades. 2. Strikebound steelworks have been quietly buying scrap for delivery after they resume operations, which means they won't have to purchase huge quantities in a hurry, which would push prices up.

• **Ore Shortage Feared** — At the same time though, relatively strong, steady demand for scrap is anticipated well into 1960, since a shortage of ore may be experienced next spring because of the abbreviated 1959 lake shipping season. Even if the strike ends immediately, not much additional ore can be brought down from the head of the lakes before the winter freezeup starts.

A spring iron ore shortage will make capacity pig iron production difficult. In turn, this will make high level steelmaking operations more dependent on scrap than was the case during the first half of this year. Everything considered, it looks like a firm, fairly steady scrap market in the months ahead.

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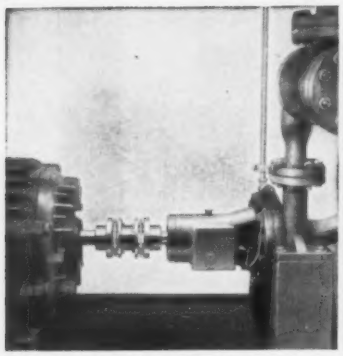

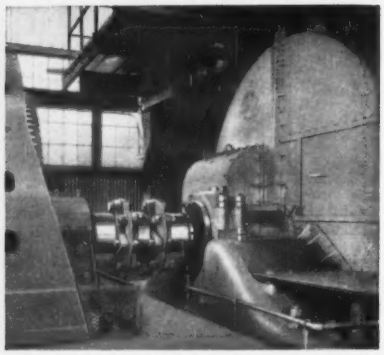

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June Steel Imports Top Exports by Wide Margin

Steel product imports totaled 410,005 net tons during June and exceeded exports for the seventh consecutive month, reports the American Iron & Steel Institute. With prestrike buying a factor, imports in the month were up 25,218 tons from the preceding month's total, and were up 283,597 tons compared with the intake in June, 1958.

Exports in the month amounted to only 191,355 tons vs. 165,856 in May and 163,309 in June a year ago.

During the first half of this year, imports totaled 1,911,797 tons vs. 589,640 during the like 1958 period. The first half total was greater than in any full year between 1954 and 1957.

Imports exceeded exports by more than 83.5 per cent in the first six months this year. In the period, exports amounted to 1,042,102 tons, a decline of 44.7 per cent compared with shipments in the like period last year.

Trends in imports and exports of steel mill products in recent months follow:

STEEL FOREIGN TRADE

(Net tons)

1958	Imports	Exports
June	126,408	163,309
July	171,179*	169,345
August	156,666	171,120
September	179,555	180,685
October	200,569	251,410
November	174,611	238,998
December	230,599*	169,508
1959		
January	229,369*	161,375
February	240,769*	167,586
March	287,417*	177,901
April	359,450*	178,029
May	384,787*	165,856
June	410,005*	191,355

*Months in which imports exceeded exports.

Interest in Conversion Steel Reported Rising

Spot shortages of steel products are worrying some small consumers. Major users, such as automakers and appliances manufacturers, are showing increased interest in conversion arrangements. Neither group is in immediate difficulty, but as steel labor negotiations drag on without prospects of early settlement, they want to play it safe.

Conversion steel cost 75 to 100 per cent more than the regular mill price, but availability is more important than price. For the most part, conversion output will have to await the end of the strike. Of mills still operating, only a few are in position to do conversion.

Even after production is resumed, the number of mills in position to supply ingots and other semifinished, or do conversion rolling, will be limited compared with the Korean War period. Reason: Companies which at that time were long on steelmaking and short on rolling facilities, or long on rolling and short on steel facilities, have rounded out their plants to bring about a balance.

An example is Inland Steel Co., which during the Korean War engaged in a sizable amount of conversion rolling because its rolling capacity was considerably greater than its steelmaking capacity. Today, the company is in close balance because of a sizable increase in steelmaking capacity.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 244 & 245

Larger sheet users are still fairly well covered on their requirements, some reporting they hold sufficient stocks to support their operations comfortably into October. Still, users generally are beginning to feel the tightening in supplies and are turning more and more to steel service centers and other sources for spot tonnages to fill inventory gaps.

All buyers are concerned over prospects for obtaining tonnage this fall, and even should the mills resume operations by the end of this month, or possibly earlier, they realize that some time may pass before operations can get back to peak and producers can promise shipments with any definite assurance.

Supply stringency is greatest in galvanized sheets, cold rolled and hot rolled sheets, in that order.

Most sheetmakers will have little tonnage to offer for delivery this year against new orders. That applies to hot and cold rolled sheets and some specialties, such as enameling stock and electrical grades. In galvanized, producers admit they have considerably more tonnage on their books than they can possibly handle this year.

Despite shortages, some backing and filling probably will be necessary as requirements finally shape up. There will be changes in consumers' needs at the last minute, all of which may lead to some deferments, if not cancellations. But such adjustments should involve relatively little tonnage.

The few sheet and strip mills operating throughout the strike have steadily extended their deliveries, although attempting to hold back

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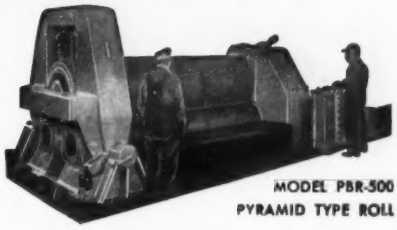
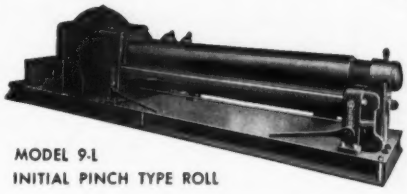


MODEL PBR-500
PYRAMID TYPE ROLL



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forward buying and new accounts. Stainless sheet deliveries have lengthened to 11 weeks and would be beyond that if all tonnage offered were booked.

Major consumers say their inventories of hot and cold rolled sheets are large enough to permit full production through Oct. 15, Pittsburgh area mills report. With a little luck on sizes, they'll be able to run until Nov. 1. After that, serious supply problems are likely.

Anticipating shortages in flat rolled products, a large manufacturer of electrical equipment started buying from service centers last week. Unfortunately, the warehouses are in no position to supply the desired widths (66 to 84 in.) in quantity. Metalworking managers say they won't buy foreign steel unless they're "really in a bind."

The sheetmakers are still trying to discourage customers from booking fourth quarter tonnage, but they're acknowledging receipt of orders. Since their backlogs are so large, the best they can do is promise delivery "X" weeks after the strike ends.

Some of the more farsighted consumers ordered all of their fourth quarter tonnage before the strike started. Now they are looking ahead to the first quarter of 1960, ordering on the basis of projected requirements. Steel that was originally scheduled for delivery in October and November probably won't be shipped until February.

Steel Bars . . .

Bar Prices, Page 243

Consumers of hot rolled carbon steel bars report increasing gaps in their inventories. With no immediate termination of the steel strike in prospect, they are pressing for shipment at the mills' earliest convenience.

Cold drawn bar users also are having more difficulty keeping abreast of their needs. Some converters are still able to offer certain sizes for shipment within a few weeks, but over-all, with most large converters strikebound, supplies of cold drawn bars are scarce.

Some distributors of cold drawn are trying to borrow tonnage from other service centers in an effort to meet the strong demand they are encountering.

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The converters are entering heavier orders for hot rolled bars to be rolled by the hot mills in the order of their acceptance. Inventories of hot rolled are substantially lower, noticeably in the case of New England converters. The latter, in addition to covering regular customers' needs, have filled tonnage needs of customers of strike-idled plants.

Since Labor Day, industrial consumers have increased inquiry for additional tonnage, both hot and cold drawn. Some users are expected to deplete their stocks shortly, and will definitely need many smaller sizes by the time production is again back to normal.

Distributors . . .

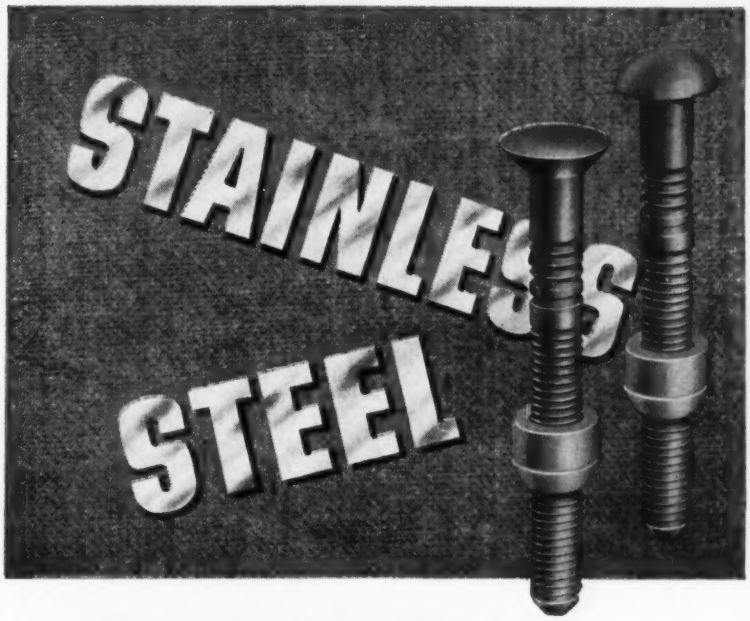
Prices, Page 248

Demand on the steel service centers is accelerating rapidly, reflecting the continued deadlock in steel wage negotiations. An eastern distributor estimates that if the mills continue strikebound until the end of this month, more than 75 per cent of his customers, who rely mainly on steel delivered direct from the mills, will be hard pressed for tonnage.

An increasing number of inquiries is crossing territorial lines. For the most part, the distributors are sidestepping out-district business as they are becoming increasingly concerned over the possibility they may not be able to take care of their regular customers if the drain on their stocks continues. They point out that even if the strikers return to work by the end of this month, some time will elapse before production gets back to normal.

A threatened strike at ten New Jersey distributors' plants by Teamsters Local 478 was recently called off when managements granted a wage increase of 10 cents an hour, with no fringe benefits. Previously, the average wage was reportedly $2.45, with fringe benefits amounting to an additional 80 cents an hour.

By the end of September, spot shortages of steel will be hurting in the Midwest. Some are being reflected in increased inquiry coming to area warehouses. An expected shortage will be in aluminum killed sheets. Warehouses can provide little relief in this area because alu-



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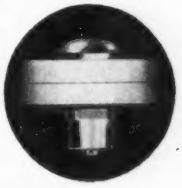

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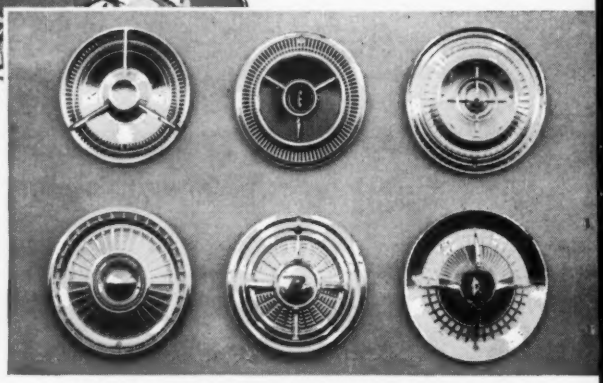

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minum killed specifications usually imply special orders for sheets for deep drawing or severe forming. Generally, the big shortages are anticipated in galvanized sheets, cold rolled sheets (particularly coils), plates, and possibly tin plate.

A service center executive in Youngstown reports his stock of cold rolled sheets has been depleted, and supplies of hot rolled are shrinking rapidly. He said foreign steel is being offered in the district at premium prices, but consumers deny they are buying it.

Pacific Coast distributors report business adversely affected by a strike of machinists that's been in effect since May. Some executives take a gloomy view of the situation, though increased scarcity of steel is expected to stimulate warehouse demand this month. Generally, area warehouse inventories are in good shape, except for galvanized sheets. Imports are not yet a great factor in the Seattle market, but it's thought increased reliance on foreign steel is inevitable if the strike continues much longer.

At Houston, distributors expect volume to pick up this month afer a disappointing August. Their inventories are satisfactory. A number of warehouses in the district have engaged in swapping material to preserve balanced stocks. Also, considerable restocking with imported steel is reported, some tight supply situations developing on items not rolled by the foreign mills. Included in the list of potentially scarce items are: Floor plates, galvanized and black sheets, wide flange beams.

Pig Iron . . .

Pig Iron Prices, Page 248

Merchant pig iron consumption should improve this month as a pickup in foundry operations is expected with the passing of the hot weather, and the end of the mass vacation season.

The steel strike has not yet had a dampening effect on manufacturing operations generally, nor has it had much effect on foundry operations. Should the deadlock continue throughout this month, however, the casting shops may experience a leveling off in October, if not a decline, with a corresponding effect on the movement of pig iron.

The foundries have been keeping fairly busy throughout the summer, except for suspensions for vacations. Merchant iron producers that have continued to operate throughout the strike period are doing a brisk business, and there appears to be enough iron available for current needs.

Foreign iron is entering the U. S. market in increasing volume. Imports in the first half of this year amounted to 209,664 net tons, up 168,552 tons, or 410 per cent, compared with the tonnage imported in the like 1958 period. Meanwhile, exports in the period amounted to only 3409 tons, down sharply from the 93,809 tons moved in the same six months a year ago.

Wire . . .

Wire Prices, Pages 245 & 246

The bulk of production by New England wire mills still operating is high in low carbon specialties. Output is confined to nonintegrated producers, as is the case elsewhere. Most of those mills have substantial stocks of rods, assuring active production for some time to come.

Consumers stocked heavily in specialties before the strike, but they are now beginning to order short sizes and grades in larger volume.

The supply of cold heading wire is becoming increasingly short.

When the mills resume production they will get into operation on July delivery tonnage. The carryover of unfilled June business was small. New business is being accepted, but will not be scheduled for production until the mills are able to assess their position after the strike ends.

Tool Steel . . .

Tool Steel Prices, Page 247

Shipments of tool steel (excluding hollow drill steel) in July totaled 8013 net tons, reports the American Iron & Steel Institute. That was off sharply from the 12,032 tons shipped in the preceding month, due to the steel strike and the seasonal slump in manufacturing demand because of vacation suspensions. In July a year ago, shipments totaled only 3891 tons.

The movement of tool steel in the first seven months of this year was

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62,949 net tons, up sharply from the 38,063 tons moved in the corresponding period of 1958.

New Steel Firm Acquires Buffalo District Works

Seaway Steel Corp., a new company, is taking over the steel rolling facilities of Buffalo Bolt Co. in North Tonawanda, N. Y. Robert E. Rich, president, says the strategic location of the mill in a seaway port should greatly enhance its importance.

Leasing of the plant, and purchase of the machinery and materials, are expected to be completed in a few days.

This is said to be the first new steel rolling mill company to be organized in the Niagara frontier area in more than a half century.

Iron Ore . . .

Iron Ore Prices, Page 249

Shipments of Lake Superior iron ore (U. S. and Canadian ports) in August totaled only 797,979 gross tons, down 8,526,082 tons from the 9,324,061 shipped in August, 1958, reports the American Iron Ore Association. Suspension of mining and shipping operations as the result of the steel strike caused the severe drop.

An iron ore shortage in the winter and spring of 1959-60 is feared as a result of the cutting off of lake shipments beginning in mid-July. Even though shipments are resumed this month, too little time is left before the winter freezeup to make up the strike deficit.

Through August, season shipments of ore from the head of the Great Lakes totals 36,375,821 gross tons, up 5,298,190 tons from the 31,077,631 brought down through August a year ago when consumption was much slower than it has been this year.

Railroads operating docks in Lake Erie ports are setting up emergency iron ore storage facilities at additional lake points. Present docks are filling up with other than Lake Superior ores. For example, the Pennsylvania has set up a yard at Erie, Pa., to which ore must be moved by rail.

Ore has been coming in from Labrador and Liberia to the Lake Erie docks. But some steelmakers may be in trouble if the strike goes into October because the Lake ships will have too little time to bring down much Lake Superior ore.

Tubular Goods . . .

Tubular Goods Prices, Page 247

Cast iron pipe sales agencies in the Pacific Northwest report order volume is better than it was at this time a year ago. New business in the last 60 days was substantial, about 500 tons having been booked for shipment to Anchorage, Alaska, alone. Various water districts in the area have either placed tonnage or are in the market.

Hughes Tool Co. reports that 2107 rotary rigs were operating in the Southwest oil fields in the week ended Aug. 31. That was 33 fewer than in the week preceding, but was 196 more than in the comparable week a year ago.

Plates . . .

Plate Prices, Page 243

Plate fabrication has not yet been seriously affected by the steel strike. But another three to four weeks may see the fabricators in a serious supply pinch, as their stocks are being steadily reduced and sources outside the strikebound mills have less tonnage to offer.

Tank and boiler shops in the East have sufficient inventories for the time being, but it's expected they'll be scratching for supplies within a month, judging from their efforts to line up new tonnage. The oil and chemical equipment people are pushing the market for tonnage, and industrial equipment builders are putting out feelers.

Carbuilders hold fairly comfortable supplies. They have received few new sizable equipment orders in recent weeks. The shipyards are reported fairly well stocked for the remainder of the year.

New England shops are having only indifferent success in covering their requirements. The volume is not large, but failure to get steel will mean some projects may be delayed. Also, it's reported that some alloy and special treatment steel required by the naval shipyards may be a bottleneck in operations. Chemical plants and the paper mills in the area are in better supply position on carbon plates than they are on clad and alloy material.

DISTRICT INGOT RATES
(Percentage of Capacity Engaged)

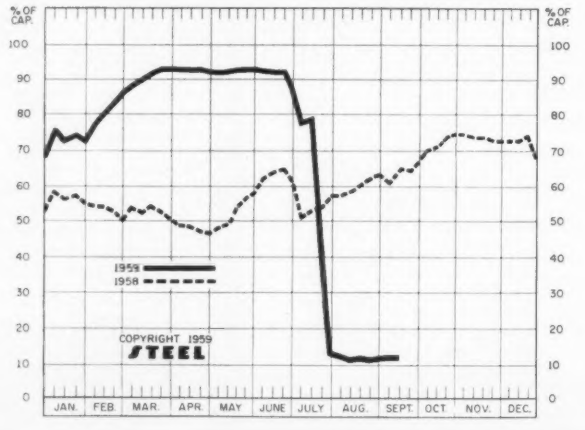
	Week Ended Sept. 13	Change	Same Week 1958	Same Week 1957
Pittsburgh	2	+ 0.5*	61.5	81
Chicago	5	0	74.5	80
Eastern	10	0	64	85
Youngstown	9	0	58	77
Wheeling	47.5	+ 0.5	68	92.5
Cleveland	6	6*	54.5	82.5
Buffalo	4	0	56	100
Birmingham	7.5	— 1.5	53.5	73
Cincinnati	70.5	+ 5	76.5	83
St. Louis	58	— 1.5	82.5	86.5
Detroit	23.5	0	77.5	97
Western	6	0	73	94
National Rate	12	0	65	81.5

INGOT PRODUCTION

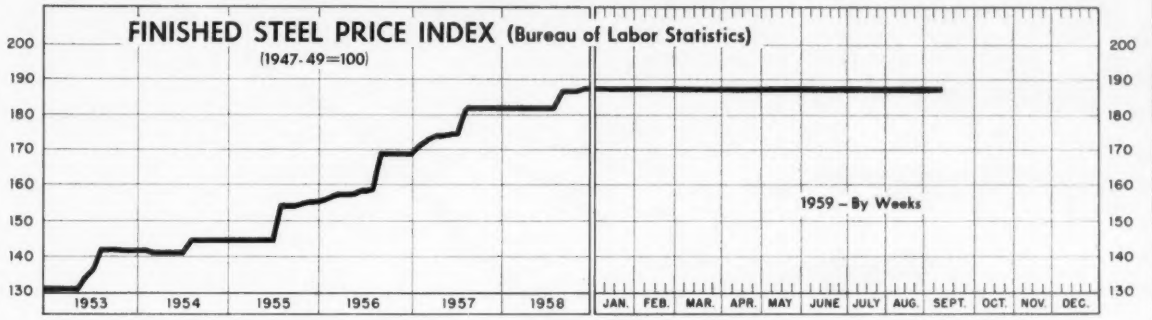
	Week Ended Sept. 13	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	21.0	20.7	20.9	110.8
NET TONS (In thousands)	337	332	335	1,780

*Change from preceding week's revised rate.
†Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Sept. 8, 1959	Week Ago	Month Ago	Aug. Index	Year Ago
186.7	186.7	186.7	186.7	185.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.533
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.722
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	246.65	194.19
Index in cents per lb	6.713	6.713	6.713	6.682	5.261

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$149.28	$117.77
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steemaking Scrap, GT	40.00	39.00	38.33	42.67	29.75

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Sept. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.675	4.30
Bars H.R., Chicago	5.675	5.675	5.675	5.675	4.30
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.975	4.55
Bars, C.R., Pittsburgh	7.65*	7.65*	7.65*	7.65*	5.40
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.50	4.25
Shapes, Std., Chicago	5.50	5.50	5.50	5.50	4.25
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.77	4.53
Plates, Pittsburgh	5.30	5.30	5.30	5.30	4.225
Plates, Chicago	5.30	5.30	5.30	5.30	4.225
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.30	4.225
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.30	4.225
Plates, Claymont, Del.	5.30	5.30	5.30	5.30	4.225
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Sheets, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Chicago	6.275	6.275	6.275	6.275	4.95
Sheets, C.R., Detroit	6.275	6.275	6.275	6.275	5.10
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.875	5.45
Strip, H.R., Pittsburgh	5.10	5.10	5.10	5.10	4.05
Strip, H.R., Chicago	5.10	5.10	5.10	5.10	4.05
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.425	5.75
Strip, C.R., Chicago	7.425	7.425	7.425	7.425	6.00
Strip, C.R., Detroit	7.425	7.425	7.425	7.425	5.60-5.90
Wire, Basic, Pittsburgh	8.00	8.00	8.00	8.00	5.75
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.85
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$99.50	$78.00
Wire rods, 7/32-5/8" Pitts.	6.40	6.40	6.40	6.40	4.675

PIG IRON, Gross Ton	Sept. 9 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	49.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	50.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	190.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$38.50	$38.50	$38.50	$42.50	$30.50
No. 1 Heavy Melt, E. Pa.	41.00	40.00	40.00	40.00	28.75
No. 1 Heavy Melt, Chicago	40.50	38.50	36.50	45.50	30.00
No. 1 Heavy Melt, Valley	41.50	41.50	41.50	43.50	30.50
No. 1 Heavy Melt, Cleve.	38.50	38.50	38.50	40.00	28.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	34.50	26.50
Rails, Rerolling, Chicago	62.50	61.50	59.50	65.50	44.50
No. 1 Cast, Chicago	55.50	53.50	53.50	46.50	35.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Testing Ground...

WALL TUBE

AND METAL PRODUCTS CO.

Today's aircraft subjects even the most durable metals to tests so strenuous our engineers are taxed to pre-test them. But test them we do . . . with all the resources our technology has devised. Wall Tube has increased its testing facilities to include the very latest equipment available. Our own assurance that we're making the best product possible is assurance your product will meet the test.

RANGE OF MANUFACTURE:

Stainless Steel—Welded and Cold Drawn—1⅛" OD to 3/32" OD; .083 to .008 walls.

Seamless—⅝" OD to 3/32" OD; .049" to .008" walls.

Nickel and nickel alloy—seamless ⅝' 'OD to 3/32" OD; .049" to .008" walls.

This Name Counts!

WALL TUBE AND METAL PRODUCTS CO.

NEWPORT, TENNESSEE

Steel Prices

Mill prices as reported to STEEL, Sept. 9, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbed following mill point indicates producing company. Key to producers, page 244; footnotes, page 246.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$76.00

INGOTS, Alloy (NT)
Detroit S41 .....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 .....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
Sharon,Pa. S3 .....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ...$82.00
Bessemer,Pa. U5 .....80.00
Buffalo R2 .....80.00
Clairton,Pa. U5 .....80.00
Ensley,Ala. T2 .....80.00
Fairfield,Ala. T2 .....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 .....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 .....80.00
Owensboro,Ky. G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 .....80.00
Youngstown R2 .....80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$99.50
Buffalo R2 .....99.50
Canton,O. R2 .....102.00
Clairton,Pa. U5 .....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 .....99.50
Fairfield,Ala. T2 .....99.50
Farrell,Pa. S3 .....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 .....99.50
Geneva,Utah C11 ....99.50
Houston S5 .....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 .....109.00
Midland,Pa. C18 .....99.50
Munhall,Pa. U5 .....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 .....109.00
Sharon,Pa. S3 .....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 .....99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 .....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit S41 .....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 .....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 .....119.00
Houston S5 .....124.00
Ind.Harbor,Ind. Y1 ...119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 .....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 .....119.00
Midland,Pa. C18 .....119.00
Munhall,Pa. U5 .....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 .....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ...119.00
Struthers,O. Y1 .....119.00
Warren,O. C17 .....119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$122.50
Canton,O. R2 .....125.00
Cleveland R2 .....122.50
Gary,Ind. U5 .....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 .....122.50

SKELP
Aliquippa,Pa. J5 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Warren,O. R2 .....5.65
Youngstown R2, U5 ....5.65

WIRE RODS
AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 .....6.40
Alton,Ill. L1 .....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 .....6.40
Cleveland A7 .....6.40
Donora,Pa. A7 .....6.40
Fairfield,Ala. T2 .....6.40
Houston S5 .....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 .....6.40
Joliet,Ill. A7 .....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 .....6.50
LosAngeles B3 .....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 .....6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 .....6.40
Roebling,N.J. R5 .....6.50
S.Chicago,Ill. R2, W14..6.40
SparrowsPoint,Md. B2..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill. N15 .....6.50
Struthers,O. Y1 .....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 .....5.50
Atlanta A11 .....5.70
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa. B2 .....5.55
Birmingham C15 .....5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Houston S5 .....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 .....5.55
Joliet,Ill. P22 .....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 .....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 .....5.50
Niles,Calif. P1 .....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 .....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 .....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 .....5.50

Wide Flange
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.50
Fontana,Calif. K1 .....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 .....5.50
Sterling,Ill. N15 .....5.50
Weirton,W.Va. W16 ....5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....6.90
Munhall,Pa. U5 .....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 .....8.05
Bessemer,Ala. T2 .....8.05
Bethlehem,Pa. B2 .....8.10
Clairton,Pa. U5 .....8.05
Fairfield,Ala. T2 .....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 .....8.05
Geneva,Utah C11 .....8.05
Houston S5 .....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 .....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 .....8.75
Munhall,Pa. U5 .....8.05
Seattle B3 .....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 .....7.75
Struthers,O. Y1 .....8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 .....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 .....8.05
S.Chicago,Ill. U5 .....8.05
Sterling,Ill. N15 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.55
Ind.Harbor,Ind. I-2 ...5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 .....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ...6.50
Munhall,Pa. U5 .....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 .....6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 .....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 .....5.50
Bessemer,Ala. T2 .....5.30
Clairton,Pa. U5 .....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 .....5.30
Coatesville,Pa. L7 .....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 .....5.30
Fairfield,Ala. T2 .....5.30
Farrell,Pa. S3 .....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 .....5.30
Geneva,Utah C11 .....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 .....5.40
Ind.Harbor,Ind. I-2, Y1 5.30
Johnstown,Pa. B2 .....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 .....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 .....5.30
Newport,Ky. A2 .....5.30
Pittsburgh J5 .....5.30
Riverdale,Ill. A1 .....5.30
Seattle B3 .....6.20
Sharon,Pa. S3 .....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 .....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 .....5.30
Youngstown U5, Y1 ....5.30
Youngstown (27) R2 ...5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....7.05
Fontana,Calif. K1 .....7.85
Geneva,Utah C11 .....7.05
Houston S5 .....7.15
Johnstown,Pa. B2 .....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron
Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.95
Ashland,Ky. A10 .....7.95
Bessemer,Ala. T2 .....7.95
Clairton,Pa. U5 .....7.95
Claymont,Del. C22 .....7.95
Cleveland J5, R2 .....7.95
Coatesville,Pa. L7 .....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 .....7.95
Ecorse,Mich. G5 .....7.95
Fairfield,Ala. T2 .....7.95
Farrell,Pa. S3 .....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 .....7.95
Geneva,Utah C11 .....7.95
Houston S5 .....8.05
Ind.Harbor,Ind. I-2, Y1 7.95
Johnstown,Pa. B2 .....7.95
Munhall,Pa. U5 .....7.95
Pittsburgh J5 .....7.95
Seattle B3 .....8.85
Sharon,Pa. S3 .....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 .....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy
Aliquippa,Pa. J5 .....7.50
Claymont,Del. C22 .....7.50
Coatesville,Pa. L7 .....7.50
Economy,Pa. B14 .....7.50
Farrell,Pa. S3 .....7.50
Fontana,Calif. K1 .....8.30
Gary,Ind. U5 .....7.50
Houston S5 .....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 .....7.50
Lowellville,O. S3 .....7.50
Munhall,Pa. U5 .....7.50
Newport,Ky. A2 .....7.50
Pittsburgh J5 .....7.50
Seattle B3 .....8.40
Sharon,Pa. S3 .....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 .....7.50

FLOOR PLATES
Cleveland J5 .....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ...6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
S.Chicago,Ill. U5 .....6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 .....6.05
Warren,O. c.l. R2 .....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 .....5.875
Atlanta (9) A11 .....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 .....5.675
Canton,O. (23) R2 ....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 .....5.675
Ecorse,Mich.(9) G5 ...5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ...5.825
Fontana,Calif.(9) K1 ..6.875
Gary,Ind.(9) U5 .....5.675
Houston(9) S5 .....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11 6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ....5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11 6.375
Warren,O. C17 .....6.025
Youngstown(9) R2, U5,.5.675

Bars, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.725
Bethlehem,Pa. B2 .....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 .....6.725
Canton,O. R2, T7 .....6.725
Clairton,Pa. U5 .....6.725
Detroit S41 .....6.725
Economy,Pa. B14 .....6.725
Ecorse,Mich. G5 .....6.725
Fairless,Pa. U5 .....6.875
Farrell,Pa. S3 .....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 .....6.725
Houston S5 .....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 .....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 .....7.775
Lowellville,O. S3 .....6.725
Massillon,O. R2 .....6.725
Midland,Pa. C18 .....6.725
Owensboro,Ky. G8 .....6.725
Pittsburgh J5 .....6.725
Sharon,Pa. S3 .....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.735
Struthers,O. Y1 .....6.725
Warren,O. C17 .....6.725
Youngstown U5 .....6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....8.30
Bessemer,Ala. T2 .....8.30
Bethlehem,Pa. B2 .....8.30
Clairton,Pa. U5 .....8.30
Cleveland R2 .....8.30
Ecorse,Mich. G5 .....8.30
Fairfield,Ala. T2 .....8.30
Fontana,Calif. K1 .....9.00
Gary,Ind. U5 .....8.30
Houston S5 .....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 .....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 .....9.00
Pittsburgh J5 .....8.30
Seattle B3 .....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.03
Struthers,O. Y1 .....8.30
Youngstown U5 .....8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 .....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 .....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.675
Atlanta A11 .....5.875
Joliet,Ill. P22 .....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Seattle B3 .....6.425
SanFrancisco S7 .....6.52
Seattle B3 .....6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.80
Clairton,Pa. U5 .....6.80
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 .....6.80
Youngstown U5 .....6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2, S30 ..11.75*

Alloy
Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 .....10.175
Elyria,O. W8 .....10.175
Monaca,Pa. B17 .....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 .....8.25
Buffalo B5 .....7.70
Camden,N.J. P13 .....8.10
Carnegie,Pa. C12 .....7.65
Chicago W18 .....7.65
Cleveland A7, C20 .....7.65
Detroit B5, P17 .....7.85
Detroit S41 .....7.65
Donora,Pa. A7 .....7.65
Elyria,O. W8 .....7.65
FranklinPark,Ill. N5 ...7.65
Gary,Ind. R2 .....7.65
GreenBay,Wis. F7 .....7.65
Hammond,Ind. J5, L2 ...7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 .....7.65
LosAngeles(49) B30 ....9.10
LosAngeles(49) P2, R2..9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 .....7.65
Monaca,Pa. S17 .....7.65
Newark,N.J. W18 .....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 .....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 .....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 .....8.10
Struthers,O. Y1 .....7.65
Warren,O. C17 .....7.65
Waukegan,Ill. A7 .....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 .....9.025
Camden,N.J. P13 .....9.20
Canton,O. T7 .....9.025
Carnegie,Pa. C12 .....9.025
Chicago W18 .....9.025
Cleveland A7, C20 .....9.025
Detroit B5, P17 .....9.225
Detroit S41 .....9.025
Donora,Pa. A7 .....9.025
Elyria,O. W8 .....9.025
FranklinPark,Ill. N5 ...9.025
Gary,Ind. R2 .....9.025
GreenBay,Wis. F7 .....9.035
Hammond,Ind. J5, L2...9.025
Hartford,Conn. R2 ....9.825
Harvey,Ill. B5 .....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ...9.825
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 .....9.025
Monaca,Pa. S17 .....9.025
Newark,N.J. W18 .....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 .....9.20
Struthers,O. Y1 .....9.025
Warren,O. C17 .....9.025
Waukegan,Ill. A7 .....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ...9.325
Youngstown F3, Y1 ....9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind C16 ....5.775
Lackawanna,N.Y. B2..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif P1 .....6.375
Pittsburg, Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 . 6.425
S.Chicago,Ill. R2, W14 5.675
S. Duquesne,Pa. U5 ....5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md B2..5.675
Sterling,Ill. (1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion O. P11 .....6.70
Newark,N.J U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 .....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St. Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit (8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S Chicago Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Aliquippa,Pa. J5 .....6.275
Allenport,Pa. P7 .....6.275
Cleveland J5, R2 ....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ..9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875‡
Canton O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ..6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana, Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O. (28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.875
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 ....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ..8.70
Ind.Harbor Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W107.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Welton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke. Wickwire Spencer Steel Div., Colo. Fuel & Iron
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan.San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ...5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2 5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 .....8.40
S.Chicago,Ill. W14 .....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 .7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 .....7.575
S.SanFrancisco(25) B3..8.325
SparrowsPoint,Md. B2 .7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 .....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ...5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20..7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 ....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. W10 .7.425
Fontana Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ..7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5 .7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6.7.425
Pawtucket R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon,Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2 T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ....10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	....	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.06	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.06	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	....	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	....	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23.30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W5	18.85	22.95	27.80
Palmer,Mass. W12	18.85	....	....
Trenton,N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C.R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 ....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1..7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Irvin,Pa. U5	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.20
GraniteCity Ill, G4 .....8.30
Ind.Harbor,Ind. I-2, Y1..8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg,Calif. C11 ....8.85
SparrowsPoint,Md. B2 ..8.20
Weirton,W.Va. W6 ....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary,Ind. U5 .....7.85
GraniteCity,Ill. G4 ....7.95
Ind.Harbor,Ind. Y1 ....7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8..8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ....8.35
Johnstown,Pa. B2 .....8.00
Joliet,Ill. A7 .....8.00
KansasCity,Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
Palmer,Mass. W12 .....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ....12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ..12.95
Palmer,Mass. W12 .....13.70
Pittsburg,Calif. C11 ....13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 .....12.95
SparrowsPt.,Md. B2 ...13.50
Struthers O. Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ....12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
NewHaven,Conn. A7 ...10.05
Palmer,Mass. W12 .....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ....10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Wor'ster,Mass.A7,J4.T6 10.05

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 .....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ....17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 .....17.15
Roebling,N.J. R5 .....17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

Wire, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	12.65
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburgh,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers: per cwt)

Galveston,Tex. D7 ..$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10 ..$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	9.34

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.64

Coil No. 6500 Interim

AlabamaCity,Ala. R2	9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.69

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

	Col.
Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. P5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192

WIRE (16 gage)

	An'ld Galv. Stone	Stone
Ala.City,Ala. R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80†‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80†‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass. W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.95	19.80
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

	(6 to 8 gage) An'ld Galv.	
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80††
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville Fla. M8	9.10	9.80††
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48) B2	9.10	9.775§
St'ling(37)(48) N15	9.10	9.80
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass. A7	9.30	9.85†

Based on zinc price of: *13.50, †5c, §10c, ‡Less than 10c, ††10.50c, ‡‡11.00c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body(cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1¼ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread) & Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

½ in. diam	50.0
⅝ in. diam	47.0
⅞ and 1 in. diam	43.0
1⅛ and 1¼ in. diam	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:	
All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:	
¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):	
¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.9
1⅝ in. and larger	51.5
Hex Nuts, Finished (Incl. Slotted and Castellated):	
⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):	
⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	66.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:	
6 in. and shorter:	
⅝ in. and smaller	55.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0
High Carbon, Heat Treated:	
6 in. and shorter:	
⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0
Flat Head Cap Screws:	
¾ in. and smaller, 6 in. and shorter	+85.0
Setscrews, Square Head, Cup Point, Coarse Thread: Through 1 in. diam:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in. larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No.2	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.75	5.60	....	6.725
Ensley,Aal. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05a.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.35c for 17 Ga. & heavier.
(14) Gage 0.148 to 0.249 in.; for gage 0.142 and lighter, 5.30c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.25c.
(27) Bar mill discs.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45a.
(31) Widths over ⅝ in.; 7.75c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.065" and heavier, 0.25c higher.
(41) 0.15c for cut lengths.
(42) Mill location, f.o.b. mill; deld. in mill zone or within switching limits, 5.625a.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 6-7 Ga.
(49) 2½ in. and smaller rounds: 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3¼		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRICWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown B2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. P6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+28.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.75	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	35.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	85.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.00	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	29.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	43.25	43.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates: Carbon Base 5%	Plates: Carbon Base 10%	Plates: Carbon Base 15%	Plates: Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	56.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.55	....
Nickel	41.65	51.95	63.80	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.06	....

	Strip, Carbon Base Cold Rolled 10%	Strip, Carbon Base Cold Rolled Both Sides
Copper*	$35.85	$42.50

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.209
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.599

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld	....	75.50	76 00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding Monaca,Pa., deld.	....	68.26	68.26	69.79
Verona,Trafford,Pa deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
Granite City,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% Si or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. K2	89.00
Keokuk,Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos 0.035% max)	$73.00
Rockwood Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max).	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 10 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Atlanta	8.59§	9.86§	10 13	....	8.91	9.39	13 24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8 18	9.45	10 46	....	8.51	8.99	....	....	9 00	8.89	10.90
Boston	10.07	11.42	11 92	53.50	12.17	10.19	13.30 #	15 64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11 45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10 66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10 95	53.43	8.83	9.31	11.58 #	15 37	9.56	9.27	10.53
Cleveland	8.54(a)	8.79(b)	10.87(a)	52.33	10.32(c)	8.75(d)	11.25 #	15.16	9.39	8.71(e)	10.50(f)
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.54(a)	8.79(b)	10.76(a)	52.33	10.30(c)	8.64(d)	11.25 #	15.05	9.00	8.47(e)	10.26(f)
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[2]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡⅜ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

(a)10 Ga.; (b)20 Ga.; (c)¼ x 1 in.; (d)⅝-2½ in.; (e)¼ x 84 in.; (f)¼ x 36.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [8]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates ..... nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	15.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min. trucklots, freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10‡
40 mesh, bags	8.10††
Electrolytic Iron,	
Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16 plus 100 mesh)	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed, c.l.	38.50; ton lots 40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	33.30-49.50†
Bronze, 5000-lb lots	50.50-54.60†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	51.50-56.00†
Phosphor-Copper, 5000-lb lots	62.80
Copper (atomized) 5000-lb lots	43.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min. minus 65 mesh	Dollars nom**
Chromium, electrolytic 99.8% Cr, min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. § Cutting and scrafing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett Mass., ovens:	
New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.68
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't. Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$6.13	$6.13	$6.08	$5.98	$6.44
Bar Size Angles	6.13	6.13	6.08	5.98	6.44
Structural Angles	6.03	6.03	5.98	5.88	6.28
I-Beams	6.03	6.03	5.98	5.88	6.28
Channels	6.03	6.03	5.98	5.88	6.28
Plates (basic bessemer)	5.87	....	5.87	5.77	6.17
Sheets, H.R.	7.00	7.00	6.95	6.85	7.25
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.30	9.30	9.25	9.15	9.65
Sheets, Galv. (in coils) 20 Ga., 48 in. wide	9.45	9.45	9.40	9.30	9.70
Sheets, C.R. (drawing quality)	8.50	8.50	8.45	8.35	8.75
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.22	25.06	24.91	24.61	26.28
Barbed Wire (†)	7.15	7.15	7.10	7.00	7.40
Merchant Bars	6.18	6.18	6.13	6.03	6.43
Hot-Rolled Bands	6.00	6.00	5.95	5.85	6.25
Wire Rods, Thomas Commercial No. 5	6.10	6.15	6.10	6.00	6.35
Wire Rods, O.H.	6.65	6.70	6.65	6.55	6.90
Bright Common Wire Nails (§)	7.65	7.65	7.60	7.50	7.90

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb $1.55 (Ti 38-43%, Al 2% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. **Charge Chrome 2:** Cr 58-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. **Refined Chrome 2:** Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload, bulk, 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c, less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ¼" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y.; lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l., lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload, bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed ,bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ⅛ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

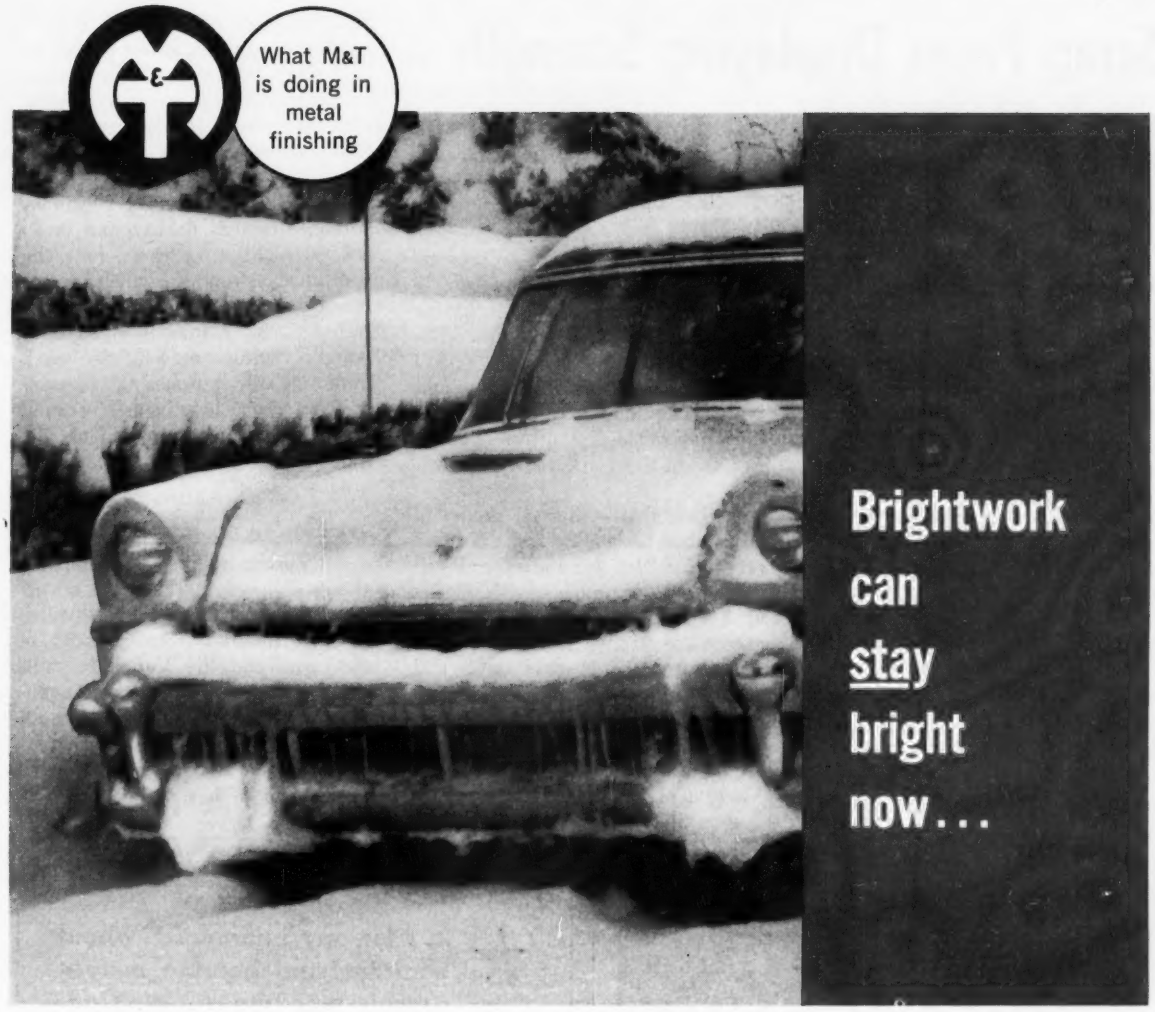
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



New M&T Chromium Plating Discovery offers most economical way to improve durability

Durability of chromium plated parts in severe, accelerated corrosion tests has been increased up to 500% by the revolutionary Unichrome "Duplex Chromium" Plating Process developed by Metal & Thermit.

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M&T "Duplex Chromium" consists of a layer of Unichrome Crack-Free Chromium which blocks infiltration of corrosives to underlying metal. It is followed by another layer of Unichrome SRHS® Chromium to build up proper thickness. The additional millionths of an inch more chromium, in these two layers, do more for outdoor durability than any other change in present plating procedure. Results show that per dollar invested in equipment and solutions, this new technique gives greater benefits than a corresponding expenditure for thicker copper and nickel undercoats. It saves on capital investment because existing production equipment can be used. It saves by cutting rejects of parts which are now required to survive more rigorous life tests than heretofore.

Simply by adding the few additional minutes to plating time and using M&T "Duplex Chromium", you can add *years* to the life of chromium plated finishes in outdoor exposure. Send for data. Or ask the M&T Man about it.

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Scrap Prices Displaying Strength

STEEL's index on No. 1 heavy melting grade advances $1 to $40 despite absence of active buying. Market firming on trade expectations of active poststrike demand

Scrap Prices, Page 254

• **Chicago** — Bullishness continues in the scrap market and most steelmaking grades are up $1 to $2 a ton. Although mills have been idled for 60 days by the strike, they are buying material quietly. Sales are difficult to ferret out and frequently are denied, but it is obvious consumers will be obliged to pay several dollars a ton more for material after the strike ends than they did before the shutdown. Foundry and cast iron grades are in strong demand, following the trend upward.

• **Pittsburgh**—The market appears strong despite limited activity. A large mill confirmed the $30 price on No. 2 bundles by purchasing additional tonnage at that figure for delivery after the strike. Consumers probably couldn't buy No. 1 heavy melting scrap in quantity for less than $43 or $44 a ton. Because railroad lists are small (B&O is offering nothing), bidding should be fairly brisk. Prices may close $1 or $2 above last month's. Foundries are in the market for wheels.

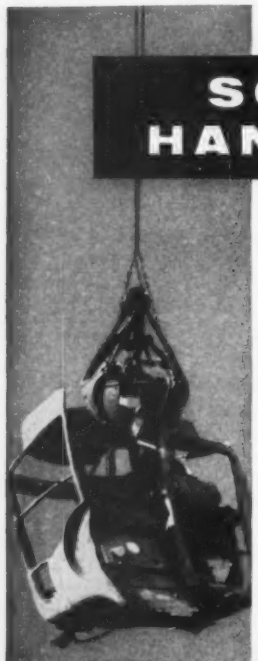
• **Philadelphia**—All steel grades of scrap have been advanced $1 a ton, except for No. 2 bundles and rail crops. No. 1 cupola cast is higher at $41-$42, delivered. Other cast grades are steady.

The strength in steel scrap still reflects primarily the active demand for export, with domestic buyers having to pay more to get tonnage. Domestic purchases though are not heavy and are confined mostly to needs of mills still in operation.

Advances in the minor grades of steel scrap reflect no direct foreign buying, but rather are in sympathy with the uptrend in the open hearth grades moving abroad.

• **Detroit** — The market continues strong, although dealers and brokers see little reason for the continued strength which seems based on a few Canadian and Ford transactions. Canadian mills have bought bundles at $40, delivered. Ford is still purchasing foundry steel in special lengths and in small lots. No action is reported on No. 2 items, turnings, or the cast iron grades.

• **Cleveland**—Except for a couple small purchases by Valley mills at the established market level no activity has appeared the last week or so. Material is moving out of this area and the Valley to mills operating on extended labor contracts. Despite the sluggishness, the market is bullish, dealers anticipating a strong poststrike demand due to a likely shortage of



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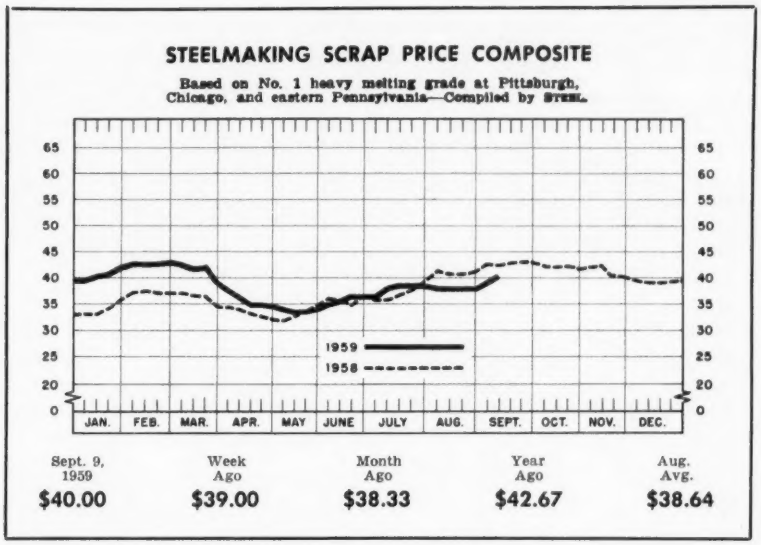

iron ore during the coming winter and spring, and resulting pinches in pig iron supplies.

• **New York**—Except for No. 1 bundles, brokers have advanced their buying prices $1 a ton on the open hearth grades to meet the pressure of demand from abroad. They have not increased their prices for the minor grades of steel scrap or for the cast iron grades.

• **St. Louis**—Though prices generally are static, the market is described as being as "hot as a firecracker." Scrap is in a strong position and the mills are reaching outside the district for supplies. Buying prices do not reflect the real market picture, as "outside the price" deals are common. Prices shown for the open hearth grades are minimums, with the tendency definitely upward.

• **Cincinnati**—Dealer confidence in the market is keeping it strong. Little trading is reported, however. A large area mill (unaffected by the strike) entered the market for September tonnage offering the same prices as a month ago. No. 1 heavy melting continues quoted by brokers at $35.50-$36.50.

• **Buffalo**—The cast iron grades are providing a little spark to activity in this market. They have gone up another $2 a ton on consumer purchases. Cupola cast is quoted $46-$47, and No. 1 machinery cast $50-$51.

A limited market exists for prime industrial steel at premium prices. But no purchases at premium levels by local mills have been reported.

• **Birmingham**—Little buying is being done here due to continuance of the steel strike. A recent railroad list closing found no buyers in the district, but exporters are reported active at prices generally 50 cents to $1 above those quoted a month ago. Scrap is coming into yards in dribbles. Prices are unchanged.

• **Houston**—Competition for export tonnages has generated slightly higher prices here, in Baton Rouge, and in New Orleans. Houston shippers are receiving up to $39 for No. 1 heavy melting, delivered shipside. Baton Rouge-New Orleans quotations show a top of $41 for the No. 1 grade, and $38 for No. 2 heavy melting.

District demand for plate and structural material has resulted in a $2.50 per ton increase on the low phos grades. However, the cast iron scrap market is easier.

• **Seattle**—The scrapyards are accumulating stocks in anticipation of an early resumption in mill buying. Unprepared material is moving, but no prepared scrap is changing hands.

Japanese interests are reported negotiating for more than 50 cargoes of scrap for fourth quarter shipment. However, it's expected the business will be placed largely on the Atlantic and Gulf Coasts.

• **San Francisco** — Two or three boatloads of steel scrap will leave this port this month for Japan. That will be comparable to recent shipments. Prices are holding at the top level of $36.

• **Los Angeles** — Local scrapyards are bulging with inventories. Export material is flowing steadily to Japanese buyers, and little price

(*Please turn to Page 259*)

COVERED HOT TOP BRICK
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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, Sept. 9, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 9	$40.00
Sept. 2	39.00
Aug. Avg.	38.84
Sept. 1958	42.87
Sept. 1954	29.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	33.00-34.00
No. 1 dealer bundles	39.00-40.00
No. 2 bundles	29.00-30.00
No. 1 busheling	41.00-42.00
No. 1 factory bundles	47.00-48.00
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*24.00-25.00*
Cut structurals:	
2 ft and under	48.00-49.00
3 ft and under	47.00-48.00
Heavy turnings	34.00-35.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Stove plate	45.00-46.00
Unstripped motor blocks	33.00-34.00
Clean auto cast	46.00-47.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Rails, 2 ft and under	58.00-59.00
Rails, 18 in. and under	59.00-60.00
Random rails	55.00-56.00
Angles, splice bars	53.00-54.00
Railroad specialties	53.00-54.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*41.00-42.00*
No. 1 hvy melt., dealer	*39.00-40.00*
No. 2 hvy melting	*36.00-37.00*
No. 1 factory bundles	44.00-45.00
No. 1 dealer bundles	*40.00-41.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling, indus.	*41.00-42.00*
No. 1 busheling, dealer	*39.00-40.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals, 3 ft	*50.00-51.00*
Punchings & plate scrap	*49.00-50.00*

Cast Iron Grades

No. 1 cupola	*55.00-56.00*
Stove plate	*51.00-52.00*
Unstripped motor blocks	*46.00-47.00*
Clean auto cast	*61.00-62.00*
Drop broken machinery	*61.00-62.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*44.00-45.00*
R.R. malleable	*62.00-63.00*
Rails, 2 ft and under	*59.00-60.00*
Rails, 18 in. and under	*60.00-61.00*
Angles, splice bars	*54.00-55.00*
Axles	*58.00-59.00*
Rails, rerolling	*62.00-63.00*

Stainless Steel Scrap

18-8 bundles & solids	210.00-215.00
18-8 turnings	110.00-115.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	27.00-28.00
No. 1 busheling	44.00-45.00
No. 1 bundles	44.00-45.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	45.00-46.00
Electric furnace bundles	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	43.00-44.00

CLEVELAND

No. 1 heavy melting	38.00-39.00
No. 2 heavy melting	27.00-28.00
No. 1 factory bundles	44.00-45.00
No. 1 bundles	40.00-41.00
No. 2 bundles	25.00-26.00
No. 1 busheling	40.00-41.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	40.00-41.00
Cut structurals, plates 2 ft and under	47.00-48.00
Low phos. punchings & plate	41.00-42.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	41.00-42.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	36.00-37.00
Brake shoes	36.00-37.00
Clean auto cast	52.00-53.00
Burnt cast	37.00-38.00
Drop broken machinery	52.00-53.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel (Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	39.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	54.00
Charging box cast	45.00
Heavy breakable cast	44.00
Unstripped motor blocks	44.00
Clean auto cast	56.00
Stove plate	*45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00*
Rails, 18 in. and under	*51.50*
Rails, random lengths	45.00
Rails, rerolling	59.00
Angles, splice bars	48.00

BIRMINGHAM

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	38.00-39.00
No. 2 bundles	23.00-24.00
No. 1 busheling	38.00-39.00
Cast iron borings	14.00-15.00
Machine shop turnings	24.00-25.00
Short shovel turnings	27.00-28.00
Bar crops and plates	44.00-45.00
Structurals & plates	44.00-45.00
Electric furnace bundles	38.00-39.00
Electric furnace:	
3 ft and under	37.00-38.00
2 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Stove plate	54.00-55.00
Charging box cast	29.00-30.00
Unstripped motor blocks	42.00-43.00
No. 1 wheels	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	52.00-53.00
Rails, rerolling	57.00-58.00
Rails, random lengths	46.00-47.00
Angles, splice bars	44.00-45.00

PHILADELPHIA

No. 1 heavy melting	*41.00*
No. 2 heavy melting	*36.00*
No. 1 bundles	*42.00*
No. 2 bundles	27.00-28.00
No. 1 busheling	*42.00*
Electric furnace bundles	*43.00*
Mixed borings, turnings	20.00†
Short shovel turnings	24.00
Machine shop turnings	20.00
Heavy turnings	34.00
Structurals & plate	43.00-45.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Heavy breakable cast	45.00
Drop broken machinery	50.00-51.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	*20.00-21.00*
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00†
Short shovel turnings	13.00-14.00†
Low phos. structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*46.00-47.00*
No. 1 machinery	*50.00-51.00*

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	35.50-36.50
No. 2 heavy melting	30.50-31.50
No. 1 bundles	35.50-36.50
No. 2 bundles	25.00-26.00
No. 1 busheling	35.50-36.50
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	19.00-20.00
Cast iron borings	18.00-19.00
Low phos., 18 in.	46.00-47.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Heavy breakable cast	43.00-44.00
Charging box cast	43.00-44.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00

HOUSTON

(Exporters' buying prices; f.a.s.)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*35.00-36.00*
No. 2 bundles	*25.00-26.00*

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00
No. 2 bundles	20.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos, plates & structurals	*45.50-46.50*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Heavy breakable	33.00
Foundry malleable	*43.00-44.00*
Unstripped motor blocks	38.50-39.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-25.50
No. 1 bundles	*30.00-31.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	9.00-10.00
Short shovel turnings	11.50-12.00
No. 1 cast	37.00-38.00
Mixed cupola cast	36.00-37.00
No. 1 machinery cast	38.00-38.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	23.00-24.00
No. 1 bundles	*37.00-38.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*34.00-35.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	15.00-16.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	38.00-39.00
Heavy breakable	39.00-40.00
Unstripped motor blocks	27.00-28.00
Charging box cast	39.00-40.00
Clean auto cast	49.00-50.00

SEATTLE

No. 1 heavy melting	35.00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00-39.00*
No. 2 heavy melting	36.00*
No. 1 bundles	33.00
No. 2 bundles	*20.00*
Machine shop turnings	16.00
Shovel turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

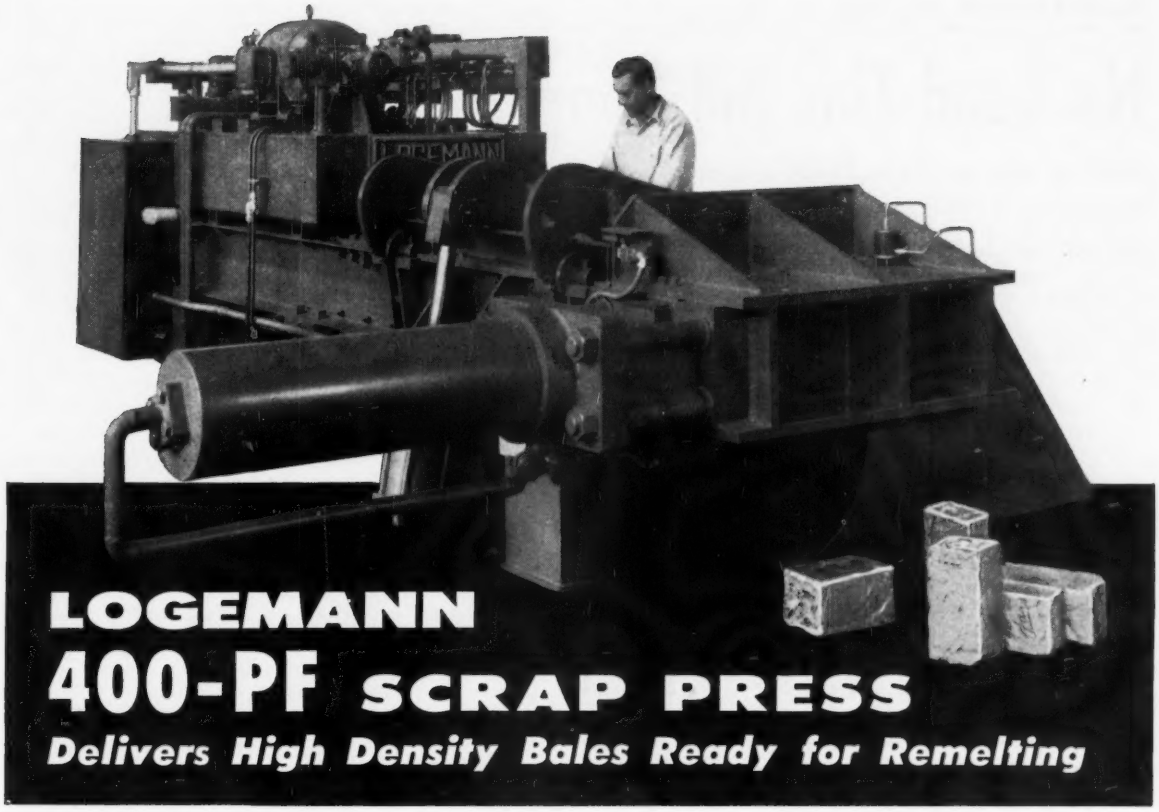
(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

*Delivered to docks.
†Nominal.
‡F.o.b. Hamilton, Ont.



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Delivers High Density Bales Ready for Remelting

▶ Designed Specifically for Pressing:

☆ COPPER ☆ BRASS ☆ ALUMINUM

☆ STAINLESS STEEL AND BLACK STEEL SCRAP

☆ WIRE ☆ COILS ☆ SKELETONS

☆ CONTAINERS ☆ UTENSILS

HERE ARE THE FEATURES YOU WANT

Top-loading by means of a filling-hopper which can be charged at floor level; a tamper-cover to crush down bulky scrap into the press-box; a charging plate arrangement that permits the hopper to dump a load of scrap into the press while a bale is being made, thus speeding up the production; and the positive discharge of the bale from the bottom. Bottom discharge insures cleaning of the box with each bale, avoiding contamination of bales by foreign matter that might otherwise remain in the press-box.

OPERATION IS ENTIRELY HYDRAULIC

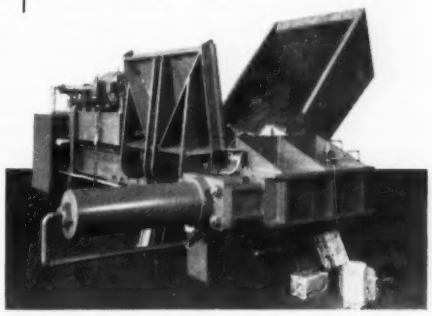
Special valves are controlled by electric switches and relays. To retain flexibility, the hopper and tamper-cover are independently controlled; pressing and bale discharge are automatic, though manual control is also available, when desired.

SPECIFICATIONS

Press-box is 72 inches long, 36 inches wide and 12 inches deep, and the loading area is 60 inches by 36 inches. Bales are 12 inches high, width can be optionally 7, 6, 5 or 4 inches, length varies depending on the character and quantity of scrap charged, which also determines the bale weights. High density is attained through use of powerful hydraulic rams.

OUTPUT

Hourly output is determined by speed of loading. Press operates at high speed; three charges can be in process simultaneously — one in the filling hopper, another on the charging plate, a third under compression.



When writing for complete details, please state the quantity and character of scrap to be baled.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

No Lead-Zinc Bill Soon

Chances are slim for any lead-zinc measure passing Congress before early spring when Tariff Commission studies are completed. Odds good for minerals bill. Market quiet

Nonferrous Metal Prices, Pages 258 & 259

IF YOU'VE become confused by the myriad of actions to aid the metal industry emanating from a host of government departments, you have lots of company.

• **Status**—As Congress gets set to adjourn and trek back home to mend fences with constituents, here's where the various bills stand:

H. R. 177, passed by the House, calls for a national minerals program and "increased production and employment in critically depressed domestic mining and minerals industries." Expectations are the resolution will pass the Senate before Congress adjourns. It may replace a similar measure (S. 1537) sponsored by Sen. Gordon Allott (R., Colo.), although there's a chance the Senate may also act on S. 1537.

Five mine state congressmen have introduced identical bills to aid small lead and zinc producers through a program of stabilization payments. Chances are nil for passage at this session.

• **No Lead-Zinc Bill** — In fact, chances for any lead and zinc legislation coming out of this session are as dead as yesterday's weather forecast. Proponents are pinning their hopes on the Tariff Commission's findings, which means there probably won't be extreme pressures for legislation until at least next spring.

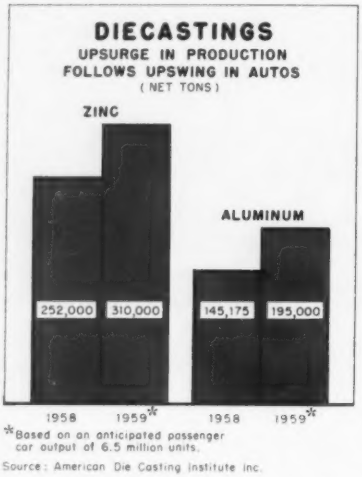
In the interim, here's what the Tariff Commission will be doing:

1. Conducting an escape clause investigation on whether or not the importation of zinc sheets is causing injury to domestic companies. It should be completed by Jan. 24.

2. Running a study on whether imports of lead and zinc fabricated products are causing injury.

3. A study on the entire lead and zinc import picture that was directed last month by a Senate resolution. The commission is required to report back to Congress no later than Mar. 31.

Also underway: A Senate directed study on fluorspar imports. Hearings are set for Dec. 15. The commission must report its findings to Congress by Feb. 29.



No Break in Deadlocks

It doesn't look like there is any chance for an early settlement in the widespread strikes affecting copper, lead, and zinc. Except for agreement between the union and American Brass Co. (which is not likely to set a pattern), nothing is happening right now. No further talks are scheduled nor have there been any overtures on the part of either management or the unions.

The feeling among metal executives is that the strikes could easily last through October and possibly into November.

It's believed the Mine-Mill people would now accept a package settlement of 22 or 23 cents an hour. While this is a considerable comedown from original demands, it still isn't popular with nonferrous management.

Nickel Sales Fair

Nickel sales, though hurt, are holding up well despite the steel strike. Demand from platers and foundries has been strong. So has demand from Europe.

Continued good business plus strong government pressures are probably the reason International Nickel Co. Inc. recently agreed to a renegotiation of its stockpile contracts with the government. In essence, Inco relieved the government of the obligation to take the remaining 26 million lb of nickel contracted for during the Korean War. About 150 million lb actually found its way into government stockpiles during the life of the contract.

The Inco deal may pretty much mark the end of renegotiation in the metals field. At least, that's the feeling of the General Services Administration which believes the $300 million it has saved the government via the renegotiation route is about the maximum it can get.

NONFERROUS PRICE RECORD

	Sept. 9 Price	Last Change	Previous Price	Aug. Avg	July Avg	Sept., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.700
Copper	30.00–33.00	Aug. 31, 1959	30.00	30.010	30.048	26.428
Lead	12.80	Aug. 24, 1959	11.80	12.069	11.800	10.730
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.00	Sept. 5, 1959	102.125	102.333	102.298	94.120
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. customer custody; MAGNESIUM, pig 99.8%, Velasco, Tex.

Park Lane by Oneida, Ltd.

Quality begins with Quality

...and Bridgeport Fine Grain Brass forms the basis for gracious Oneida Hollow Ware

The outstanding reputation enjoyed by Oneida Silversmiths, Oneida, N. Y., is attributable to one cause . . . quality. Since 1848, this company has designed and manufactured the very finest in silver flatware and hollow ware.

As the basis for many of their hollowware items, Oneida chooses Bridgeport Fine Grain Brass and Copper strip. These metals are subjected to severe deep drawing and stamping. Rigid inspection assures that each piece of Community fully meets the company's unqualified demands for "perfectionism." The grain of the copper and brass strip must be closely controlled to take the many polishing and buffing operations that follow forming. At the same time, the strip must be sufficiently ductile to take deep drawing and stamping without cracking or waving. Strip surface must be absolutely free of any imperfections.

Fine grain brass and copper are only two of the many closely quality-controlled alloys produced by Bridgeport for the *benefit* of hundreds and hundreds of products. Strip, for example, can be made to the most exacting tolerances and finishes from end to end on Sendzimir mills. Your production operations benefit by running with fewer interruptions when you use Bridgeport's long-length coils.

Behind Bridgeport's outstanding products and manufacturing facilities is Bridgeport Technical Service, ready to help with your product design and production. Technical Service – plus top quality strip, tube, rod and wire are a combination that can make your product better, your production methods more efficient. Call your nearest Bridgeport Sales Office or write to Department 3910 for your copy of our "Fine Grain" Brochure.

BRIDGEPORT BRASS COMPANY

Bridgeport 2, Connecticut • Sales Offices in Principal Cities

Specialists in Metals from Aluminum to Zirconium

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. customer custody.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb nom.

Copper: Electrolytic, 30.00-31.50 deld.; custom smelters, 33.00; lake, 30.00-31.50 deld.; fire refined, 29.75-31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 per troy oz nom.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $225-227 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., 50-4999 lb, $8.15-11.50 per lb, depending on quantity; 5000 lb or more, $8 per lb, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.50 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.00.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.60 per lb; grade A-2 (0.5% Fe max.), $1.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.25; special high grade, 12.50 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 14.75; No. 5, 14.50 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.
(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 108 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass, No. 115, 30.75; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 35.00; No. 1 yellow, No. 405, 25.75; manganese bronze, No. 421, 28.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.895, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.875, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 35.355; l.c.l., 35.98. Weatherproof, 20,000-lb lots, 36.29; l.c.l., 37.04.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	46.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.530	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 23.00-23.50; light copper, 23.00-23.50; No. 1 composition red brass, 18.75-19.25; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 30.00c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	53.13b	51.36c	....	54.32	26.000	26.000	25.250
Yellow Brass	47.24	32.81d	47.78	50.65	19.625	18.750	17.750
Low Brass, 80%	50.03	47.97	50.57	53.34	22.000	21.750	21.250
Red Brass, 85%	51.02	50.96	51.56	54.33	22.875	22.625	22.125
Com. Bronze, 90%	52.55	52.49	53.09	55.61	23.875	23.625	23.125
Manganese Bronze	55.65	49.24	59.74	....	18.375	18.125	17.500
Muntz Metal	49.95	45.26	....	....	18.375	18.125	17.625
Naval Brass	51.90	45.71	58.46	55.31	18.250	18.000	17.500
Silicon Bronze	59.23	58.42	58.77	76.89	25.500	25.250	24.500
Nickel Silver, 10%	62.85	65.17	65.17	....	24.500	24.250	12.250
Phos. Bronze	73.92	74.42	74.42	75.60	27.125	26.875	25.875

a. Cents per lb, f.o.b. mill; freight allowed on 50 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 17.25-17.75; new brass clippings, 15.00-15.50; light brass, 12.00-12.50; heavy yellow brass, 13.00-13.50; new brass rod ends, 13.00-13.50; auto radiators, unsweated, 14.25-14.75; cocks and faucets, 14.75-15.00; brass pipe, 15.00-15.50.

Lead: Soft scrap lead, 8.75-9.25; battery plates, 4.50-4.75; linotype and stereotype, 10.00-10.50; electrotype, 8.25-8.75; mixed babbitt, 9.25-9.75.

Monel: Clippings, 30.00-32.00; old sheets 26.00-28.00; turnings, 20.00-22.00; rods, 30.00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.00-11.50; clean borings and turnings, 7.00-7.50; segregated low copper clips, 15.00-15.50; segregated high copper clips, 14.25-14.75; mixed low copper clips, 14.50-15.00; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.00-16.50; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-1175; clean borings and turnings, 10.50-11.00 segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 56.00; light scrap, 51.00; turnings and borings, 36.00.
Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.50; light copper, 23.00; refinery brass (60% copper) dry copper content, 24.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.50; No. 2 heavy copper and wire, 25.50; light copper, 23.00; No. 1 composition borings, 22.00; No. 1 composition solids, 22.50; heavy yellow brass solids, 17.50; yellow brass turnings, 14.50; radiators, 18.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 46.29; oval, 44.50, 5000-10,000 lb; electrodeposited, 41.00, 2000-5000 lb lots; cast, 43.50, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 120.50; 200-499 lb, 119.00; 500-999 lb, 118.50; 1000 lb or more, 118.00.

Zinc: Balls, 18.50; flat tops, 18.50; flats, 21.25; ovals, 20.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 14.95; 2000-5900 lb, 12.95; 6000-11,900 lb, 12.70; 12,000-22,900 lb, 12.45; 23,000 lb or more, 11.95.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 23.80; 400-800 lb, 20.80; 1000-4900 lb, 19.80; 5000-19,900 lb, 18.80; 20,000 lb or more, 17.60.

Sodium Stannate: Less than 100 lb, 74.50; 100-600 lb, 70.20; 700-1900 lb, 67.40; 2000-9900 lb, 65.60; 10,000 lb or more, 64.20.

Stannous Chloride (Anhydrous): 25 lb, 155.00; 100 lb, 150.10; 400 lb, 147.70; 800-19,900 lb, 106.80; 20,000 lb or more, 100.70.

Stannous Sulphate: Less than 50 lb, 140.20; 50 lb, 110.20; 100-1900 lb, 108.20; 2000 lb or more, 106.20.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 253*)
fluctuation is foreseen in the near future.

Structural Shapes . . .

Structural Shape Prices, Page 243

While structural steel fabricators still emphasize that they are more concerned about lack of orders than they are about a shortage of steel, nevertheless they report increasing difficulty in filling broadening gaps in their steel inventories. To date, however, they have been able to maintain normal operations, working off backlogs primarily accumulated last spring.

Most shops have sufficient work in hand to keep them going well into the fall, unless labor disturbances develop. Some of the fabricating shops have labor agreements that terminate within the next few weeks.

Completion dates for some bridge contracts in New England are likely to be extended if supplies of structural steel are curtailed through this month. Wide flange tonnage is becoming noticeably short with some shops.

Only one structural mill in the East is rolling shapes.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3710 tons, elevated structure, Baton Rouge Expressway, Louisiana, to Bethlehem Steel Co., Bethlehem, Pa.; Philip R. Farnsworth & Co. Inc., New Orleans, general contractor.

950 tons, electrical engineering building, Georgia School of Technology, Atlanta, to Bristol Steel Co., Bristol, Va.; Abco Builders Co. Inc., Atlanta, general contractor.

855 tons, six highway bridges, Danbury, Conn., to Grand Iron Works, Bronx, N. Y.; L. G. DeFelice & Son Inc., North Haven, Conn., general contractor; 460 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

650 tons, Medford Bridge, Humboldt County, California, to Pacific Coast Div., Bethlehem Steel Corp., Seattle; Peter Kiewit Sons Co., Seattle, general contractor.

505 tons, addition, Memorial Hospital, Charlotte, N. C., to Marko Engineering Co., Charlotte; Little Construction Co., Charlotte, general contractor.

480 tons, guided missile maintenance shop, Pueblo, Colo., to Austin Bros. Steel Co., Dallas; C. H. Leavell & Co., El Paso, Tex., general contractor.

375 tons, girders, Washington State Hood Canal floating bridge, to Leckenby Structural Steel Co., Seattle.

325 tons, research laboratory, Philco Co., for erection in Whitpain Township, near Philadelphia, to F. M. Weaver Co., Lansdale, Pa.

300 tons or more, also reinforcing, Seattle general office for Pacific Coast Div., Bethlehem Steel Co., to Bethlehem Steel Co.; John H. Sellen Construction Co., Seattle, general contractor.

300 tons, estimated, powerhouse and tunnel, Navy installation, Cutler, Maine, to Groisser & Schlager Iron Works, Somerville, Mass.; Consolidated Constructors Inc., Portland, Maine, general contractor.

285 tons, senior high school, Derry, Pa., to Bethlehem Steel Co., Bethlehem, Pa., through W. F. Sutter, general contractor.

250 tons, satellite station, Ft. Greeley, Alaska, to United Iron Works, Seattle; general contract to Chris Berg Inc., low at $3,023,204 to the U. S. Engineer.

225 tons, office building, York, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

135 tons, junior high school, Wakefield, Mass., to Groisser & Schlager Iron Works, Somerville, Mass.; M. S. Kelliher Co., Boston, general contractor.

125 tons, hospital addition, Ephrata, Pa., to High Welding Co., Lancaster, Pa.

120 tons, St. Anne's School, Barrington, Ill., to Vierling Steel Works, Chicago.

STRUCTURAL STEEL PENDING

14,000 tons, superstructure, 37th to 47th Streets, Damen Avenue viaduct, Chicago, Bethlehem Steel Co., Bethlehem, Pa., low.

1600 tons, school, Western Pennsylvania State School & Hospital, Cannonsburg, Pa., John McShain Inc., Baltimore, low on general contract. The project is for the General State Authority, Harrisburg, Pa.

1000 tons, gates, spillways, locks, etc., John Day Dam; bids to U. S. Engineer, Walla Walla, Wash., Nov. 19.

710 tons, Public School No. 274, Brooklyn, N. Y.; Wilaka Construction Co. low bidder on the general contract.

522 tons, state bridgework, Putney, Vt., bids Sept. 11.

340 tons, research laboratory, Philco Co., Philadelphia, for erection in a suburb in Montgomery County, Pennsylvania; Ballinger Co., Philadelphia, low on the general contract.

185 tons, bank and office building, Wilmington, Del.; inquiry withdrawn pending redesign of project.

160 tons, including piles and reinforcing bars, state highway bridge, Stonington, Conn.

110 tons, one 3-span, and one single-span wide flange composite bridge, Cavendish, Vt., Miller Construction Co., Windsor, Vt., low on general contract; also required, 55 tons of reinforcing bars.

100 tons, sewage disposal plant, Bay Park, N. Y., bids Sept 8.

100 tons, transfer warehouse, Seattle; alternatives for wood; bids in.

85 tons, including reinforcing, Icicle Creek bridge, Wenatchee National Forest, Washington State; bids to the U. S. Forest Service, Portland, Oreg., Sept. 18.

CLASSIFIED

FOR SALE—Two General Electric heat treating furnaces, first class operating condition, type T2754, Catalog #6937230G, complete with all control equipment and automatic flame curtain. For further information contact OKLAHOMA IRON & METAL COMPANY, P. O. BOX 1749, PHONE—RO 56596, PONCA CITY, OKLAHOMA.

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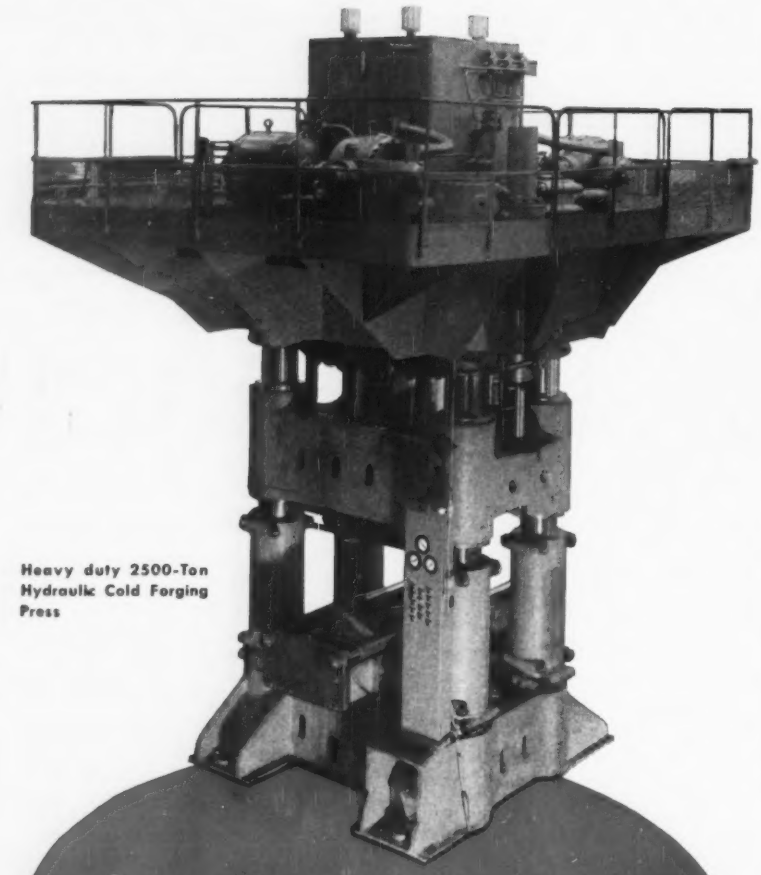

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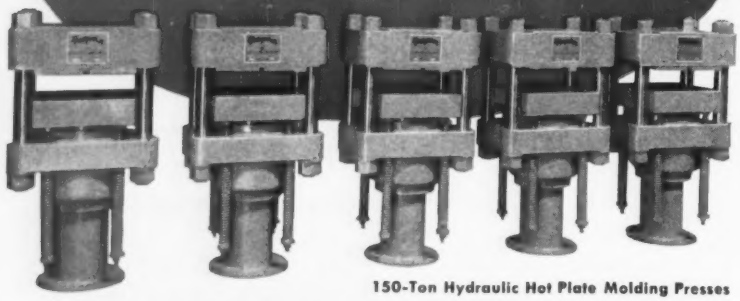

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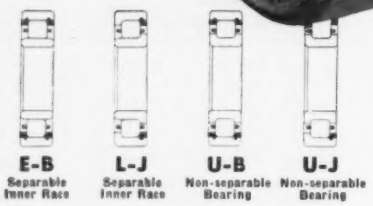

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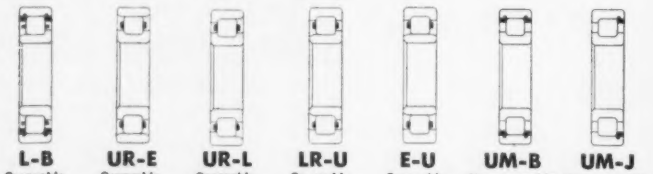

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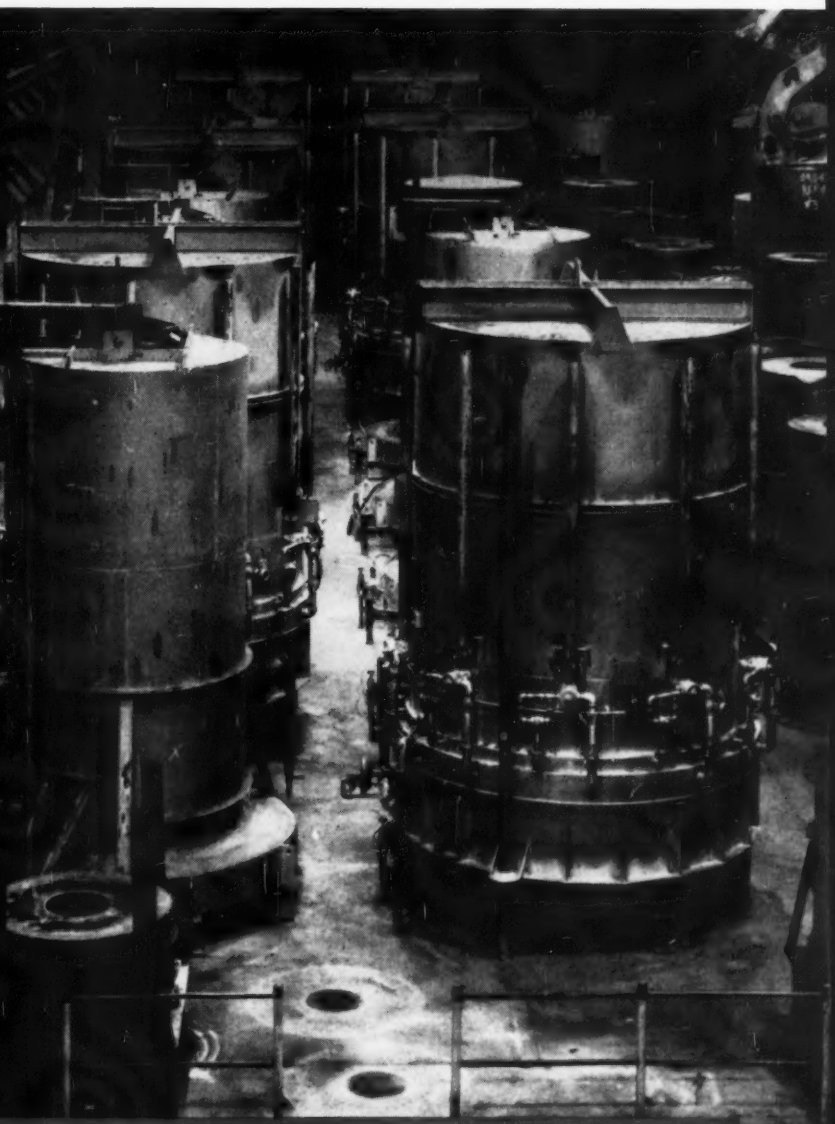

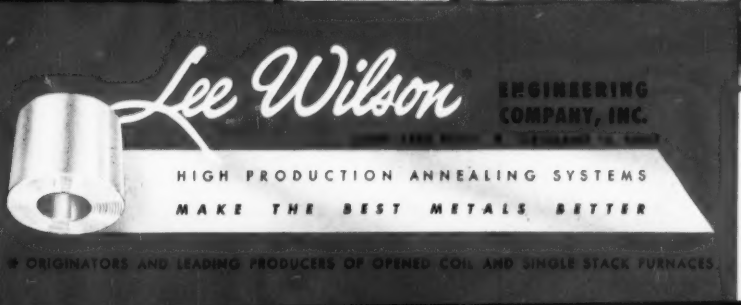
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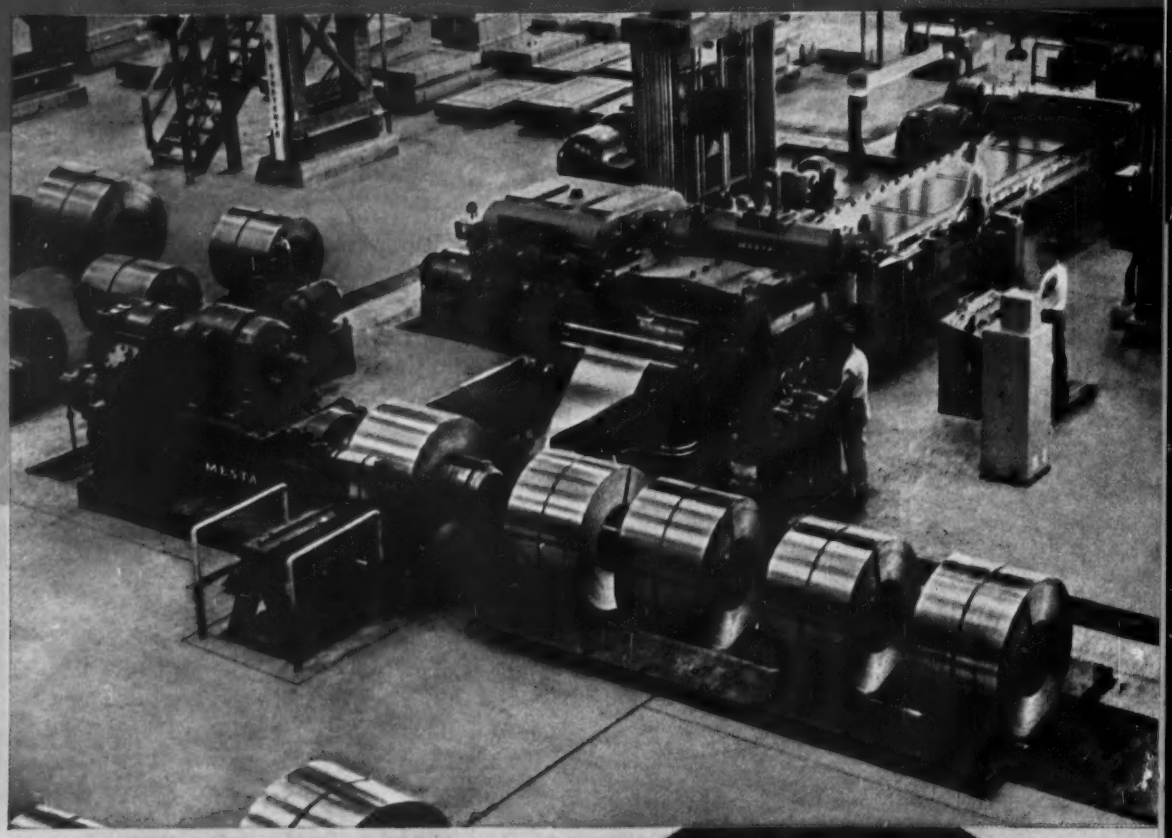

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